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EDITOR OF THE MONTH

RICHARD KOVACS, M.D.

New York, N. Y.

Printed in U. S. A

Schools Approved for Training Physical Therapy Technicians by the Council on Medical Education and Hospitals

Name and Location of School	Medical Director	Entrance Requirements *	Duration and Time of Admissions: Regular Course	Duration and Time of Admissions: Emergency Course	Tuition †
Children's Hospital, Los Angeles	Steele F. Stewart, M.D.	(a) R. N. (b) Phys. educ. major (c) 2 yrs. coll.	12 mos. Feb. and Sept.	6 mos. Feb. and Sept.	$200 R $200 E
College of Medical Evangelists, Los Angeles	Fred B. Moor, M.D.	(a) R. N. (b) Phys. educ. major (c) 2 yrs. coll.	12 mos.	.....	.....
Stanford University California	William H. Northway, M.D.	(a) R. N. (b) Phys. educ. major (c) 3 yrs. coll.	12 mos. Jan. and June	7 mos. Jan. and June	$429 R $286 E
Walter Reed General Hospital, Wash., D.C.	B. A. Strickland, Jr., Capt., M. C.	Phys. educ. major	.....	6 mos Quarterly	None
Northwestern Univ. Medical School, Chgo.	John S. Coulter, M.D.	(a) R. N. (b) Phys. educ. major (c) 3 yrs. coll.	9 mos. Oct.	6 mos. Jan. and July	$200 R $200 E
Bouvé-Boston School of Physical Education, Boston	Arthur L. Watkins, M.D.	High school grad.	3 yrs. 4 yrs. ‡ Sept.	6 mos.	$400 R ? E
Harvard Medical School, Boston	Frank R. Ober, M.D.	(a) R. N. (b) Phys. educ. major 2 yrs. coll.§	9 mos. Sept. and March	6 mos. Sept. and March	$200 R $200 E
Boston Univ. Sargent College of Physical Education, Cambridge, Mass.	Louis Howard, M.D.	2 yrs. coll.	2 yrs. Oct.	‖	$547
University of Minn., Minneapolis	M. E. Knapp, M.D.	(a) R. N. (b) Phys. educ. major (c) Med. tech. grad. with B.S. degree	12 mos. June and Sept.	.....	Univ. fees
Mayo Clinic, Rochester, Minn.	Frank H. Krusen, M.D.	(a) R. N. (b) Phys. educ. major (c) 2 yrs. coll.	.....	6 mos. Jan. and July	None
Barnes Hospital, St. Louis	Frank H. Ewerhardt, M.D.	(a) R. N. (b) Phys. educ. major (c) 2 yrs. coll.	9 mos.	.....	.....
St. Louis University, School of Nursing, St. Louis	Alexander J. Kotkis, M.D.	High school grad.	4 yrs. Jan. and Sept.	.....	$250 yr.
University of Buffalo, School of Nursing, Buffalo	George G. Martin, M.D.	(a) R. N. (b) Phys. educ. major (c) 2 yrs. coll.	12 mos. Feb. and Sept.	6 mos. Feb. and Sept.	$425 R $375 E
Hospital for Special Surgery, New York City	Kristian G. Hansson, M.D.	(a) R. N. (b) Phys. educ. major (c) 2 yrs. coll.	9 mos. Sept.	6 mos. Sept.	$300 R $200 E
New York University, New York City	William Bierman, M.D.	(a) R. N. (b) Phys. educ. major (c) 2 yrs. coll.	9 mos.	.....	.....
D. T. Watson School of Physiotherapy, Leetsdale, Pa.	Jessie Wright, M.D.	(a) R. N. (b) Phys. educ. major (c) 2 yrs. coll. ¶	2 yrs. Sept.	6 mos. Jan. and July	None R $200 E
Richmond Professional Institute of the College of William and Mary, Richmond, Va.	Thomas W. Wheeldon, M.D.	(a) R. N. (b) Phys. educ. major (c) Coll. graduate (d) High school grad.	8 mos. 4 yrs. Feb. and Sept.	.....	Coll. fees
University of Wisconsin Medical School, Madison	Ernst A. Pohle, M.D.	(a) R. N. (b) Phys. educ. major	12 mos. Feb. and Sept.	6 mos.	Univ. fees R
University of California Hospital, San Francisco	Frances Baker, M.D.	(a) R. N. (b) Phys. educ. major (c) B. A. degree **	48 wks. October	.....	$150.00
Cleveland Clinic Foundation Hospital, Cleveland, Ohio	Walter J. Zeiter, M.D.	(a) R. N. (b) Phys. educ. major (c) 2 yrs. coll.	9 mos. July	.....	None

* Courses are so arranged that any of the entrance requirements (a, b, c or d) will qualify students for training.

** Acceptable science courses required.

† R = regular course; E = emergency course.

‡ Four year course leads to B.S. degree from Simmons College.

§ This group admitted to emergency course only.

‖ Emergency course offered in co-operation with Harvard Medical School.

¶ Only those with three years of college are admitted to emergency course.

PHYSICAL THERAPY IN CERTAIN MEDICAL CONDITIONS *

GEORGE MORRIS PIERSOL, M.D.

PHILADELPHIA, PA.

Confronted as we are with the most serious crisis in our country's existence, it becomes increasingly necessary that we should avail ourselves of every possible means of maintaining the health of the nation at the highest level of efficiency. All the resources at our command must be utilized to reduce to a minimum the incidence of disabling disease among our civilian population and to lessen the period of disability of those who become ill by employing every method designed to shorten convalescence, so that the vitally important productive effort of the nation shall not suffer and the staggering losses in both time and money incident to illness may be eliminated. These responsibilities are placed on us in addition to those incident to maintaining the ever increasing millions that swell our armed forces in the highest state of health and effectiveness. Stupendous as is the latter problem, it is destined to be augmented a hundred fold when we are confronted with the task of caring for those who inevitably will be returned disabled from the far flung conflicts in which we are engaged.

Such present and future responsibilities place grave obligations on the medical profession and the various groups that are allied with it. If our attack on these problems is to be successful, we must be prepared to avail ourselves of every well recognized and effective form of therapy. In the front rank of those procedures which, if properly understood and intelligently applied, are capable of lessening disability, shortening the duration of illness and adding effectively to the rehabilitation of those who are injured stands physical therapy.

It was not until after the first World War that the majority of physisians of this country came to realize that physical therapy is an important, scientifically well founded adjunct to the practice of medicine. When the results of the present conflict become more apparent, this conviction is destined to become further strengthened. During the past twenty years, physical therapy has come into its own, at least to some extent. Well regulated departments for the carrying out of physical methods of treatment have been established in many leading hospitals. An ever increasing number of trained technicians has become available. Here and there physical therapy has even been included in medical curriculums. A limited number of physicians have seriously applied themselves to both the study and the practice of this branch of medicine, but, most important of all, well organized scientific research has been undertaken by qualified workers in an effort to solve the many problems that are still present in this field. As it becomes more and more apparent that the procedures used in physical therapy are based on pure science and that we must look to the physicist, the chemist, physiologist and the pathologist for an explanation of the results that are gained, the empiricism that too often shrouded the physical therapy of the past will be replaced by the scientific truths of the future.

In spite of the better understanding of physical therapy on the part of physicians as a whole, there is still lacking the widespread acceptance of this type of treatment that must exist if physical therapy is to play the important

* Read at the Twenty-first Annual Session of the American Congress of Physical Therapy, Pittsburgh, Pa., September 9, 1942.

role it deserves in the urgent problems of maintaining and conserving our national health. Certain groups of the medical profession have been more alive to the advantage of physical therapy than others, notably the orthopedists, the neurologists and, to a considerable extent, certain groups of surgeons. Unfortunately the great majority who make up the bulk of the medical profession, the general practitioners and the internists, on whom rests primarily the responsibility for our national health, particularly the well being of our great industrial population, who are the first to come in contact with those who are ill and who must initiate and guide therapeutic efforts, have been singularly lacking in interest in and woefully slow to appreciate the importance and advantages of physical therapy. It is to these that earnest educational effort should be directed if we are to make available to this nation now and in the future the vast, latent potentialities of physical therapy.

There are certain reasons why apathy toward physical forms of treatment is found in so many physicians, especially internists. The first reason is lack of basic training in physical therapy in the majority of our medical schools. As stated on a previous occasion:

> If taught at all, but little time is devoted to the various aspects of physical therapy and at best the courses available to students of medicine are inadequate and superficial. The average physician, therefore, approaches the practice of medicine knowing little about one of the oldest and most useful branches of therapeutics.

If we are to meet successfully the problems soon to be imposed on us, when the wounded and otherwise disabled of the present conflict are returned, this situation must be promptly remedied. A step in the right direction was taken this year when the Council on Physical Therapy of the American Medical Association adopted plans for approaching and if necessary aiding all medical schools still lacking in the proper teaching of physical therapy. Much could be done to stimulate in our medical students an interest in and enthusiasm for physical therapy if those of us who are charged with the teaching of clinical medicine would evince a better practical knowledge of this form of therapeutics and more often stress its value in the management of disease.

Furthermore, physicians entering on the practice of medicine poorly equipped to carry out or even to direct physical procedures rarely make an effort to acquire a better knowledge of the subject. Heretofore they have been content, for the most part, to delegate such meager physical therapy as they may prescribe to lay technicians. More often than not such technicians are allowed to practice their art as they see fit, free from the restraining influence of a guiding medical hand.

Another factor that inhibits many physicians from a more active participation in physical medicine is the misconception that physical procedures can be carried out successfully only through the medium of complicated and expensive apparatus and paraphernalia. They lose sight of the fact that, on the whole, physical therapy is simple and that excellent results may be obtained from the proper and intelligent use of such homely procedures as massage, exercise, use of light, heat and cold and bathing in their most readily available form. The value of the simpler forms of physical therapy was apparently better understood by the physicians of a former generation than by the physicians of today. In this connection it is interesting to recall the experience of one of the great internists of the last generation, who made it almost a routine to prescribe for his ambulatory patients a simple set of morning exercises followed by some type of bath. These procedures were not ordered in a haphazard way. They were modified intelligently so as to meet the needs of each individual patient. They involved no expense, re-

quired no special training or apparatus and could readily be carried out by any one of reasonable intelligence. The beneficial results from these simple instructions faithfully followed were not limited to physical improvement, for they had an added beneficial psychologic effect. Such a routine tended to reestablish self confidence. It taught patients the importance of physical effort and made them realize that to regain their health, they had to depend on their own energy and not on the help of others.

There is another factor, largely psychologic, that prevents some physicians from making use of physical therapy. The medical profession has too long turned a deaf ear to the ever growing popular demand for physical forms of treatment. This indifference has given the numerous groups who advocate particular types of mechanical treatment and manipulation as a panacea for all ills the opportunity to obtain easily no small degree of popularity. Instead of recognizing these specialized manipulations as modifications of well known procedures in physical therapy, capable of bringing about certain physiologic changes that are productive of good results when applied in properly selected cases, the medical profession has shown a tendency to belittle them. The antipathy which has thus developed has been a strong factor in restraining many physicians from accepting and practicing legitimate forms of physical medicine. Thus, it is apparent that before we can hope to enlist the rank and file of internists in a whole-hearted support of physical therapy, much must be done to dispel the misunderstandings and prejudices that still exist.

It is not the purpose of these remarks to dwell on the physiology of the various procedures that are embraced in the term physical therapy, to elaborate on the technic of their application or to attempt to evaluate the relative merits of the various procedures. The sole object is to emphasize the value of physical therapy to internists and to point out some of the clinical conditions in which this form of therapeusis may be of distinct advantage.

The procedures in physical therapy that are readily available to all physicians include massage, exercise, the application of heat and light and hydrotherapy. Radiation therapy and electrotherapy are highly technical procedures, which are less easily carried out because their proper and safe use requires special training.

A consideration of all the conditions in which physical therapy is applicable is clearly impractical here. It must be admitted that there are few if any medical disorders for which at some time some form of physical therapy has not been advocated, too often with little or no scientific basis. Nevertheless, there are certain diseases which frequently come under the observation and care of the internist in which there is ample justification for the employment of physical measures. In properly selected cases of this type, experience has shown that suitably applied physical therapy has been a useful and often a most important adjunct in their management.

Into this category fall first the arthritides and allied rheumatoid disorders. The employment of physical therapy in the treatment of rheumatic conditions is no innovation, since there is abundant evidence that even during antiquity it was extensively used for such conditions and its value was well recognized. Today physical therapy constitutes one of the most effective means at our disposal for the management of arthritis, especially of the chronic forms in their early stages.

Of the mechanical procedures of proven value in the treatment of arthritis, massage comes first. According to Pemberton,[1] "One of the most valuable measures in the treatment of arthritis and one of the oldest therapeutic

agents in the history of medicine is massage, with its associated variations."

Until comparatively recently, the physiology of massage was little known and its application was largely empiric. Today, the mechanism which underlies the beneficial effects of massage, although far from settled, is much better understood, thanks to the work of a number of investigators, including Pemberton,[2] Mock,[3] Coulter,[4] Mennell,[5] Krogh,[6] and Bauer.[7] It has been demonstrated that massage has no significant influence on general metabolism. Even after vigorous massage, there is no production of lactic acid in the muscles or the acidosis observed after exercise, nor does massage bring about the loss of lactic acid and the alkalosis described after the application of heat. The outstanding effects of massage are due to changes brought about in the local circulation of the parts involved. These changes in turn are due to alterations in the capillary circulation, in which massage causes an increased rate of blood flow and alterations in the vessel walls that permit an accelerated interchange of substances between the blood and the tissue cells, with resulting improved metabolism.

The effectiveness of massage depends largely on its prolonged and systematic use. Its beneficial effects are most apparent in chronic conditions. For that reason, it is not a therapeutic agent that commands much attention in the teratment of the acute forms of arthritis. Its greatest value, when properly applied and systematically carried out, is found in the chronic hypertrophic or atrophic types of arthritis.

The indications for massage in arthritis, according to Pemberton,[1] are fourfold: First, to prevent or delay atrophy of muscles and to help to restore muscle tissue when atrophy has occurred; second, to improve the general and local metabolism; third, to increase the extent to which the circulating blood reaches certain tissues and to facilitate the return to the circulation of many corpuscular elements tucked away in inactive regions, and, fourth, to reduce local edema by mechanically replacing the effect normally exercised by muscles in aiding the heart to empty the venous circulation.

Massage is of value in chronic arthritis not only because of its effect on the local conditions but because general massage increases the bodily vigor and in persons incapable of much activity improves general nutrition and metabolism. In this as in all other conditions, massage should be applied intelligently and under the direction of a physician. Therefore, it is regrettable that in this country, at least, few physicians possess an adequate first hand knowledge of massage and its various modifications. As a consequence, the application of this time-honored and useful procedure is too often delegated to lay technicians. Even with little or no technical knowledge, the careful physician should be alert to the contraindications and ill effects of massage. He should be prompt to observe any unfavorable manifestations, particularly undue fatigue, the occurrence of pain in muscles and joints and other evidences of increased inflammatory reactions.

Exercise also has a definite place in the treatment of arthritis. When the arthritic patient has reacted favorably to general and local massage and the acute manifestations have subsided and convalescence has been established, active motion, carefully regulated and controlled, should be instituted, especially when there are evidences of limitations of motion. No form of passive exercise can achieve the same beneficial results for an arthritic patient as exercise which involves a definite muscular effort on the part of the patient, provided always that such exercise is kept well within the limits of the patient's potentialities.

Next to massage, the application of some form of heat constitutes one of the most useful physical therapeutic procedures in the treatment of arth-

ritis. An ever increasing number of thermotherapeutic appliances are available for the application of heat in one form or another. The application of heat in arthritis may be general or local. In whatever way heat is applied, its immediate effect is to raise the temperature of the body tissues. The extent to which the rise in temperature occurs depends entirely on the degree, extent and duration of the application. The general application of heat in its milder forms is invariably accompanied by sweating. The local effects of heat are dilatation of blood vessels, an increased rate of blood flow accompanied by increased local metabolic activity, alkalosis and probably accelerated phagocytosis, which increases local tissue immunity.

In chronic arthritis, the systemic use of heat has frequently been employed. The general application of heat is by no means suitable for all patients. Those who are to receive this type of treatment should be carefully selected. In general, the overnourished, middle-aged, robust type of person stands this form of treatment better than the patient who is debilitated, underweight and old. The commonest methods of applying systemic heat to the arthritic patient are the hot bath, the hot pack and various types of electrically heated cabinets. Patients receiving such treatments should be carefully observed, and the sweating process should never be too long or too severe. This type of treatment has enjoyed much popularity because of the well established belief that the successful treatment of arthritis depends on "elimination" and the misconception that the diaphoresis induced by heat is a means of ridding the body of various toxic products. It has been shown that blood urea nitrogen, uric acid and creatinine, as well as the non-nitrogenous constituents of the blood, are little if at all affected by sweating. The only substances that are eliminated are water and electrolytes. When their loss is excessive, dehydration and hypochloremia may result. In some instances the loss of water may be of advantage to the arthritic patient, but the chief value of the systemic application of heat in arthritis is due to the increase in circulation and metabolism that is brought about. It may be mentioned in passing that in spite of the popular expressions to the contrary, diaphoresis unaccompanied by dietetic restrictions and exercise does not bring on a permanent loss of weight, such transient loss of weight as may occur being due almost entirely to temporary dehydration. The effect of general heating in arthritis is greatly enhanced by following the sweats with properly regulated contrast baths of cool water.

The local application of external heat to the joints of the patient with chronic arthritis has a wide and useful application. Local heat may be applied by conduction when heated objects are brought in direct contact with the body, such as a hot water bottle, hot brick, hot compress or the more elaborate electrically heated pad, paraffin packs and other devices. Local heat may be applied as radiant heat or by convection, the surface of the body being heated by some external source, such as incandescent lamps placed in reflectors or coils or other forms of nonluminous heating appliance. When heat is applied by conversion, it is developed in the tissues of the body by reason of their resistance to the passage of a large amount of high frequency electric current. The physiologic effects of these different forms of local heat are essentially the same, with this exception, that conductive heat penetrates but little below the surface of the body and convective heat penetrates the skin layers and may even penetrate to some extent into the subcutaneous fat. On the other hand, the dull glow from coils is largely absorbed in the superficial layers of the skin. Conversive heat produces the greatest amount of penetration. The use of local heat is not without its dangers, and the possibilities of burns always must be considered and guarded against.

In recent years much has been said in regard to various forms of electrotherapy in the management of the arthritic patient. Enthusiastic and frequently exaggerated claims have been made for the value of medical diathermy in the treatment of the arthritides. Two forms have been used, the so-called long wave diathermy, with oscillations of about one million, and the diathermy with oscillations of the frequency of ten million, known as short wave diathermy. An unbiased review of the subject would lead one to believe that there are no particular differences in the clinical results obtained from the use of these two forms of diathermy in spite of the controversy that has been carried on between the advocates of these two types of high frequency current. The effects in arthritis are similar to those obtained from the local application of any form of heat. In some instances, however, reports indicate that these types of therapy prove to be of greater value than the other forms of thermotherapeutics.

Ultraviolet radiation also has its champions in the treatment of arthritis. It is doubtful, however, whether ultraviolet light has any specific effect on the joint conditions. In those patients who are undernourished and unable to obtain an adequate amount of sunlight it undoubtedly has an important use. Its value is chiefly as an adjunct capable of raising the blood count and improving the general nutrition, but it is doubtful whether ultraviolet radiation is in any way superior to sunlight.

The therapeutic measures just discussed in reference to arthritis, particularly massage and heat, are of equal value in those painful conditions which are so frequently associated with arthritis but which may occur without any accompanying joint involvement, namely myositis and fibrositis. These conditions are ill defined, they are regarded as part of the rheumatoid state, their causation is not clear, nor is their course and natural history definitely established. Their outstanding symptom is pain, frequently associated with a considerable amount of muscular disability. These conditions are notoriously refractory to drug therapy, but their response to suitable physical therapy is often good. As a result, many of the more unscruplous and less critical advocates of special types of physical therapy have been afforded the opportunity to make exaggerated claims and obtain much unmerited publicity.

The internist who limits the applications of physical therapy to rheumatoid disorders is neglecting many opportunities. Many of the acute infections, notably those of the respiratory tract and particularly those that are due to viruses, for example, influenza, are followed by long periods of convalescence characterized by asthenia, anemia and often great depression. These trying and costly periods of convalescence could be greatly reduced if, in addition to administering iron, vitamins, liver and nux vomica, clinicians could be induced to employ rational physical therapy. In this connection, again, massage and properly regulated active exercise accompanied by the judicious use of hydrotherapy will do much to reestablish with greater promptness normal physical endurance and a sense of well being.

Many years ago Dr. John K. Mitchell[8] carried out a careful series of observations which showed that systematic massage increases the number of red cells and the amount of hemoglobin in the circulating blood, not only in anemic but in healthy persons. Although this observation was subsequently confirmed, it has largely been lost sight of and is worthy of further study. It is probably one of the explanations of the good results obtained from massage in secondary anemias and various convalescent conditions. There is no suggestion that massage can replace the now well recognized and highly effective methods of treating the various types of anemia. As

an adjunct, however, to the more orthodox procedures, massage is well worthy of consideration.

The neurologists have been far more alive to the value of physical therapy than have most internists. The effectiveness of electrotherapy, exercise, hydrotherapy and heat when intelligently applied alone or in combination has long been acknowledged in the treatment of many organic nervous diseases, for example certain types of neuritis and the various conditions involving the impairment or loss of voluntary motion of central origin. Now we find treatment of acute poliomyelitis being revolutionized by the Kenny method, which has as its basis certain highly refined forms of physical therapy, including the use of heat and passive motion. In recent years, the neuropsychiatrists have embraced such radical forms of electrotherapeutics as the electric shock treatment, which, when carefully applied in selected cases, is bringing about results that are nothing short of dramatic, especially in such mental disorders as schizophrenia and in certain depressed states. The neurologists have not confined their use of physical therapy to organic mental and nervous disease. It is in the realm of functional nervous disorders that they have been obtaining striking results for years. Hydrotherapy has proved to be the most effective method of controlling patients in excited and maniacal states. Since the days when S. Weir Mitchell revolutionized the management of so-called "neurasthenia" and similar functional nervous disturbances by his now famous "rest treatment," internists as well as neurologists have followed his teaching and have adopted some modification of the combination of rest, massage, exercise and hydrotherapy along with hypernutrition which he popularized.

Hydrotherapy could be employed by the internist to advantage much more often than is commonly the case. The experience of the neuropsychiatrists might well be given more heed and prolonged warm or tepid baths or even the long since forgotten mustard foot bath employed to control insomnia and many forms of restlessness and excitement. It must be admitted that these forms of treatment would involve more time and trouble on the part of physicians and nurses than the indescriminate administration of hypnotic drugs. It cannot be denied, however, that the ultimate effect on the patient would be preferable.

The use of the cool or cold sponge or tub bath or cold wet pack in the control of fever is another valuable hydrotherapeutic measure that is fast escaping the attention of the internist. One has but to recall the striking results that were brought about when the Brand bath was introduced in the days when typhoid fever was rampant in our communities to realize the beneficial effects of cold bathing in the control of high temperatures. Although the outstanding effect of applying water to the body is to bring about changes in temperature, the value of cold baths in the treatment of infections characterized by long-continued fever and toxemia is due not so much to the temporary drops in temperature that occur as to the improved vasomotor tone, the lessened pulse rate, the increased blood pressure and the diminution in the nervous symptoms that are brought about.

The treatment of cardiovascular disease offers an excellent opportunity for properly applied physical therapy. The use of graduated exercises, particularly hill climbing, in certain types of myocardial disease, as first advocated by Stokes and later elaborated by Oertel, is a recognized and useful physical therapeutic procedure in the management of patients with chronic cardiac disease. Various modifications of these exercises have been advocated from time to time by modern cardiologists, but the basic principle of carefully supervised graduated exercise for the cardiac invalid has become

well established. Credit belongs to August and Theodore Schott for developing resistance movements particularly adapted to those cardiac patients who are unfit to take active exercises. These exercises consist of carefully regulated movements carried out by trained attendants so that they involve little or no effort on the part of the patient. Such forms of therapy require careful supervision and must never be carried to the point of fatigue and must be stopped or modified on the appearance of any evidence of cardiac overstrain, such as undue dyspnea, palpitations or precordial pain. A better understanding of these exercises and their wider application would undoubtedly do much to increase cardiac muscle tone and thereby lessen the period of disability and unproductiveness to which so many cardiac invalids are doomed.

The value of suitable hydrotherapy in certain cardiac conditions was long since demonstrated at Nauheim, where the most famous and effective mineral baths suitable for heart conditions are found. Here patients kept under ideal conditions and supervision were given a series of mineral baths of gradually increasing strength ending with the most active that contained nascent carbon dioxide. The effectiveness of these baths when properly administered to those in whom there still remains a reasonable amount of cardiac reserve and when supplemented by graduated exercise and a carefully regulated regimen is undeniable. Similar baths of almost equal efficacy are available in any home, in which they can be prepared artificially with little difficulty. In this country there are places where such baths exist and where they are well given, but they have never attained widespread popularity with either American patients or their physicians, largely owing to the fact that neither the public nor the medical profession of this country is spa minded and the average citizen is loath to give up his time or his energy or submit to the regulations necessary for the successful carrying out of resort treatment.

The most casual observation of any group of our draftees furnishes convincing evidence that as a nation poor posture is one of our most glaring faults. The results of faulty body mechanics, especially on the digestive apparatus, cardiovascular system and lungs has long been recognized and has been stressed by Goldthwait, Osgood and the Boston School of Orthopedists, in particular. Persons suffering from the harmful effects of poor posture come daily under the observation of the internist yet all too frequently are overlooked when the remedy lies in the proper application of physical therapy. A greater interest in and knowledge of therapeutic exercises would enable the physician to correct postural defects and eliminate the various functional visceral disorders which result therefrom.

Each year finds a wider application being made of physical therapy in medical conditions. Time is lacking even to enumerate all of the ways in which physical forms of treatment may be employed with advantage by the internist. Nevertheless, mention must be made of some of the more recent advances that have taken place in medical physical therapy.

The most radical use of heat is to be found in artificial fever therapy, a major ordeal to be carried out only by those especially trained in its use and in suitably equipped institutions. Although fever therapy has been widely applied and, according to Krusen,[9] it has been tried in the treatment of over fifty diseases, its proved usefulness is at present limited to only a few conditions. The most successful response has been obtained in neurosyphilis, and gonococcic infections have been favorably influenced by it. Its value in atrophic arthritis, rheumatic fever, undulant fever and subacute bacterial endocarditis is open to more doubt. In fever therapy we have a severe therapeutic measure concerning which at present too little is known to warrant

sweeping deductions. Extended experience in the future will doubtless demonstrate the usefulness of this type of treatment in many fields as yet unexplored.

Peripheral vascular disease, to which much attention has been directed of late, is benefited by certain forms of physical therapy, for example, the use of dry heat and Buerger's exercise in the treatment of thromboangiitis obliterans and allied disorders. More recently the alternate positive and negative pressure boot has been extensively used for conditions of this kind with at least some help, although the ultimate results have not been as encouraging as was hoped for in the beginning.

Heliotherapy has long enjoyed a well deserved reputation in the successful control of nonpulmonary tuberculosis, notably tuberculosis of the bones, joints and lymph glands.

Few procedures in physical therapy have created more popular enthusiasm than ultraviolet irradiation. It is unfortunate that this form of treatment has been made so readily available to the laity, in whose untrained hands it has been at times productive of harm rather than good. Unlimited and too often exaggerated claims, not always susceptible of scientific proof, have been made for ultraviolet irradiation. This much may be stated with reasonable assurance, that within certain ranges of wavelength ultraviolet irradiation produces chemical changes in the living animal that activate vitamin D, which influences the metabolism of calcium and phosphorus. Thus an antirachitic material is produced capable of preventing and curing rickets as well as favorably influencing tetany and other conditions that depend on calcium deficiency. Because of its bactericidal effects, ultraviolet irradiation is now being extolled as a valuable method of "sterilizing air" in wards, operating rooms, nurseries, etc. Ultraviolet irradiation has a definitely useful place in physical therapy, but it is not the panacea that the producers of mercury vapor and carbon arc lamps and other advocates would have one believe.

In the foregoing remarks an effort has been made to recall to mind the simplicity of most well recognized forms of physical therapy and their wide application in an extended range of medical conditions. In conclusion the hope is expressed that internists and general practitioners will come to approach physical therapy with the serious interest which such a fundamental and valuable branch of therapeutics deserves.

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References

1. Pemberton, Ralph: Arthritis and Rheumatoid Conditions, Philidalphia, Lea & Febiger, 1935, p. 429.

2. Principles and Practice of Physical Therapy, Hagerstown, Md., W. F. Prior Co., 1934, edited by Mock, Pemberton and Coulter, Chapter 6 in Volume I, "Physiological Influence of Massage," by Ralph Pemberton.

3. Pemberton, Ralph: Physiology of Massage, in Handbook of Physical Therapy, ed. 3, Chicago, American Medical Association, 1939.

4. Coulter, J. S.: In Cyclopedia of Medicine, Surgery and Specialties, Philadelphia, F. A. Davis Co., 1933, volume 8, p. 5-98.

5. Mennell: J. B.: Physical Treatment in Movements, Manipulation and Massage, Philadelphia, P. Blakiston's Sons & Co., 1933, p. 61.

6. Krogh, August: Anatomy and Physiology of the Capillaries, ed. a, New Haven, Conn., Yale University Press, 1929.

7. Bauer, W. W.; Short, C. L., and Bennett, G. A.: Manner and Removal of Proteins from Normal Joints, J. Exper. Med. **57**:419 (March) 1933.

8. Mitchell, J. K.: The Effect of Massage on the Number and Haemoglobin Value of the Red Blood Cells, Am. J. M. Sc. **107**:502, 1894.

9. Krusen, Frank H.: Physical Medicine, Philadelphia, W. B. Saunders Co., 1941, p. 45.

SOME PRACTICAL PROBLEMS IN THE MANAGEMENT OF THE PHYSICAL THERAPY PATIENT *

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In the management of the physical therapy patient, it is customary to give careful consideration to the technic of treatment procedures. There are, however, a number of adjuvant factors which assist in the success of the formal treatment, add to the benefits or determine the success or failure of management. Some of these factors will be discussed for emphasis in the hope that the total requirement for the expert management of the physical therapy patient may be actively considered.

Effects of Temperature

The weather is of special interest in the care of the ambulatory patient. When the outdoor temperature is cold, one must first consider whether or not the patient should be ambulatory. If he can travel in a warm automobile to and from the place of treatment, there need be no change in schedule. If he will be exposed by walking to and waiting for transportation, the penetrative effects of the cold may offset any benefit to be gained from treatment. In such cases he should be hospitalized, or, if that is not economically sound, a regimen of home management may best be adopted.

If the patient must travel through cold atmosphere, the affected part of the body should have adequate protection by added covering. For example, a patient with Bell's palsy should be required to wear a woolen helmet or shawl closely applied to the affected side of the face and head. A painful lesion of an extremity should be covered with a sleeve cut from a sweat shirt or from woolen underwear. An arm sleeve is easily anchored by leaving the shoulder girdle attached and cutting away the remainder of the garment. Such a covering may be used to advantage constantly in some cases to keep the part warmer by prevention of heat loss and chilling exposure. This is most essential when one is treating an ambulatory patient who works out of doors, in an air-conditioned factory, in a cold storage plant or in a butcher shop, etc. In the summer the patient must be cautioned against visiting air-conditioned places and against exposure to inviting chill breezes.

When any treatment is given for the purpose of increasing circulation, whether it is massage, application of heat, vascular exercise or some other form, the part under treatment should not be subjected to any immediate chilling effects. Protection following treatment affords a continuation of the benefits. Surely a patient who has received heat therapy and is in a condition of active perspiration should not be permitted to dress and go out of doors, nor should a bed patient be permitted to throw off the covers for rapid cooling. Any exposure sufficiently cooling to cause vasoconstriction defeats the continuation of the benefits of the treatment. An alcohol rub is commonly employed as a hasty aid in stopping perspiration so that the patient may dress and travel. The cooling effects of the evaporation of the alcohol result in immediate vasoconstriction and therefore in loss of the induced hyperemia. The patient receives much greater benefit when insulation against heat loss is left intact until perspiration ceases; then he should dress and sit in a waiting room until he feels comfortable. The colder the

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weather the longer the patient should be required to wait before going out of doors.

Even the placing of a warm patient in a cool bed may cause an exacerbation of acute pain. We treated a patient for sciatic neuritis during a season when the atmospheric temperature was over 90 F. The pain was relieved by each treatment, but every time the patient was returned to his hospital bed there was a marked increase in pain within ten minutes. In studying the cause we discovered that this aggravation of pain could be avoided entirely by preheating the bed.

Environmental temperatures should always be considered in relation to the management of the physical therapy patient.

Posture and Activity

Most patients will remain active up to the limit of their threshold for pain. Therefore, it becomes necessary carefully to prescribe limitations and allowances. When a condition is sufficiently painful and disabling to force the patient to remain in bed, analgesics and narcotics are valuable aids, but in spite of the use of these medicaments the requirement for rest and limited activity must be explained. The interpretation of an order for rest or activity should never be left to the patient.

A patient with an affliction which is aggravated by weight bearing and motion often is permitted to remain ambulatory. Improvement may be extremely slow or not evident even when activity is limited to travel for treatment and bathroom privilege. Often temporary hospitalization or home management should be considered as a first choice.

In cases of low back pain in which rest and relief from weight bearing are essential, I have found it inadvisable to allow even sitting in bed at meal time or getting up once daily for a bowel movement. Any weight-bearing motion may be sufficient to aggravate pain and muscle spasm. My usual order is "Off your feet and off your seat until further notice." When this order is carried out it is surprising how rapidly relaxation of spasm and relief from pain are effected. After a failure of improvement in cases in which sitting for meals and bathroom privilege was allowed daily for one to two weeks, I have witnessed marked improvement in two to three days after the patient was kept constantly recumbent.

After the period of total disability a carefully regulated return to weight-bearing motion and complete function gives gratifying results. The program should include detailed instruction, with demonstrations, as to proper body mechanics in performing daily activity. For example, teach the patient (*a*) how to get into and out of bed and how to move and turn in bed; (*b*) how to get in and out of a bathtub; (*c*) not to stand on one leg in a shower bath; (*d*) not to stand on one leg when dressing and stepping into clothing; (*e*) to stoop by bending the knees instead of the back; (*f*) to lift with the quadriceps instead of the back muscles; (*g*) how to climb onto a chair and get down; (*h*) how to get off a street car or step from a high curb; (*i*) how to get into and out of an automobile, and, finally, how to perform any body mechanics requiring weight bearing, motion and application of force. Proper body mechanics not only is a most important adjuvant to treatment for recovery but in many patients is a prophylaxis against recurrent disability.

The support or maintenance of correct posture reduces the number of physical therapy treatments and the period of disability and is a most important prophylaxis against recurrence. A few examples of supports are an orthopedic garment or brace for an injured back; a posterior molded splint for an old fracture of the tibial tuberosity; immobilization of an arm in ab-

duction and external rotation in a case of subdeltoid bursitis, not only to prevent loss of function by avoiding stiffening of the shoulder but to assist in relief from muscle spasm and pain, and placement of a folded sheet or air cushion in the lumbar arch for support while the patient is required to lie on his back. These mechanical aids and many others often are demonstrated to account for the difference between satisfactory progress and painfully slow improvement. Such aids should not be used as a last resort but rather should be among the means first considered whenever the advantage is evident. Attention should be given to the assignment of homework as a complement to more technical procedures. The patient must be coached diligently to insure his cooperation and progressive improvement. Too often the treatment given by a technician is regarded as all sufficient. If loss of function, aggravation of an inflammatory process or muscle spasm and a lack of gain during rehabilitation are to be avoided, the conduct of active management, twenty-four hours a day, needs to be prescribed.

An overzealous patient may indulge in assigned exercise too strenuously, thereby aggravating his condition. Another patient may not achieve results because of timidity or, occasionally, even a fear of recovery.

The patient's relatives may need direction regarding their efforts of encouragement. Some need to use a whip, and others need their ardor dampened. I recall a patient with a delayed union of a fracture of the humerus who had begun to regain the function of a stiffened elbow joint. The impatient husband felt that his good wife was too feeble in her attempts to carry out her prescribed exercise. He thought that his coaching would shorten the period of disability and expense. By forcing the patient to perform her exercises too violently, he caused a recurrence of the fracture. The opposite picture may prevail and the relatives be so considerate and sympathetic that they force the patient into a prolonged period of recovery by giving too much assistance and caution. In many cases the management of the family is a vital part of the treatment program.

Most of the actual coaching of the patient and his family should be done by the attending physician, or it may be done by the department of physical medicine if it is so ordered. The physical therapy physician, however, should make every effort to insure the carrying out of the total program.

Indications for Treatment

The recognition of the indications for physical therapy treatment, the evaluation of methods and the judgment as to whether the treatment is to be remedial or an adjuvant to a more extensive system of management all call for the closest cooperation between the referring physician and the physical therapy physician.

When a requisition is received for treatment it becomes the duty of the physician in charge to determine the technic of procedure. If the order does not give sufficient information about the patient, he must inquire of the attending physician or consult the clinical record. If it becomes necessary for him to examine the patient, he should do so in the presence of the attending physician or at least with his consent. It is not uncommon for a requisition to offer only a symptomatic diagnosis. This may be sufficient reason for desiring treatment, but the location of the lesion determines the nature of the technical application. Obviously the location of the lesion may not be the same as the area of distribution of pain. To treat the legs when the cause of pain is in the region of the lumbar spine; to treat a backache due to flat feet, a gynecologic condition or a metastatic carcinoma involving retroperitoneal glands with pressure on spinal nerve roots; to treat a leg

for peripheral vascular occlusion when the symptoms are the result of an ischemia caused by the spastic use of muscles in order to avoid weight bearing on a sharp exostosis on the heel; to attempt to extend an elbow in a a normal direction when the cause is a congenital variation of 6 degrees in the carrying angle as compared with that of the other arm; to treat any condition without a complete consideration of the diagnosis, is to invite failure and dissatisfaction and often adds to the disrepute of physical medicine.

When a department of physical therapy has no physical therapy physician in charge, an unfair burden of responsibility is placed on the technician. A technician, not having been trained in the art of diagnosis or in the science of pathology, can do little more than fill the prescription as written. She cannot judge the diagnostic indications; she cannot evaluate the requirement of the pathologic tissue for exacting technic; nor can she act in a consulting capacity to the referring physician. This discussion leads quickly to the conclusion that the management of the physical therapy patient involves much more than the laying on of hands and the use of a lamp or machine. Finally, it is evident that there is a vital need for a physical therapy physician in every department of physical medicine.

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THE IMPORTANCE OF PHYSICAL THERAPY IN MEXICO *

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We are now enjoying a new era of progress in physical therapy in Mexico. Plans and organizational projects are fast taking shape, and the true value and importance of physical therapy as a scientific therapeutic procedure is being more generally recognized.

We earnestly hope that the efforts put forth by our government in this progressive endeavor will be taken up and seconded with enthusiasm by our general practitioners, so that the creation of a new type of physical therapy will be possible, based on scientific principles and possessing rich possibilities of application, which, when properly supervised by competent physicians, will reach its highest degree of development and usefulness.

In Mexico the responsibility and weight of the noble task of improving our hospital conditions rests on the able shoulders of Dr. Gustavo Baz, Minister of the Department of Public Welfare. Dr. Baz, one of our most outstanding surgeons, an untiring worker and a man of universally recognized activity and ability, has focused his attention not only on the vast reorganizational plans of our hospitals already in existence but the creation of new institutions which will measure up to the latest modern developments and on the establishment of new hospitals throughout the republic.

For the immediate future, plans are already under way for the formation of departments of physical therapy as obligatory units in each of our hos-

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pitals and also for the reconditioning of the one already in operation at the General Hospital.

The General Hospital, the best known of our medical centers, has a capacity of 1,500 beds and a special outpatient clinic for the patients not hospitalized who daily seek the services of our internists and surgeons. The patient "turnover" during the period from June 1, 1941 to June 30, 1942 was as follows: Hospitalized, 17,975; outpatient clinic and first visit, 47,051; average patient contacts during the year, 140,000.

For the department of physical therapy, the figures were as follows: Diathermy, 8,023; galvanic current, 9,628; electropyrexia, 981, and massage, 10,444.

The department of physical therapy of the hospital has been handicapped and incomplete in its operation for several years, owing to the fact that the sections of hydrotherapy and gymnastics have been set aside almost entirely for the pleasure of the personnel rather than for the patient. The four sections of which the department is comprised, electrotherapy, pyretotherapy, hydrotherapy and gymnastics, are all in excellent condition, and readaptation to their original purpose would be a simple matter.

Once the building is reconditioned, completely equipped and staffed with a well trained personnel, it will be able to triple the number of patients served during the coming year.

The Children's Hospital, to be put into operation this year, will have 600 beds, and it can be stated that it will be one of the finest of its type because of its excellent organization and modern equipment.

Its set-up will be as follows: Tuberculosis, infectious diseases, orthopedics, general surgery, injuries, urinary diseases, gynecology, dermatology and syphilology, medicine, premature and nursing infants, dentistry and a general observation ward. In addition, it will be equipped with a physical therapy department, x-ray facilities and laboratories.

The department of physical therapy will be specialized along the lines of orthopedics, although it will also work in conjunction with the other sections. It will be made up of three units: Electrotherapy, hydrotherapy and a recreational therapy, with a hall for the muscular reeducation of children. This building is almost finished and already on hand are several devices, it being hoped that the equipment can be completed before long.

The section of hydrotherapy, in addition to a Hubbard tank and several whirlpool units, will have a special pool for therapeutic underwater exercises.

The Juarez Hospital, with a capacity of 900 beds, will undergo a complete reorganization so as to be available as an emergency hospital exclusively. Among the improvements planned and to be initiated this year is the creation of an extensive physical therapy service specializing in traumatology, which will include the following sections: Electrotherapy, hydrotherapy, mechanical therapy and occupational therapy (which will have a shop).

The Institute of Cardiology, which is likewise almost completed and which will be the first of the world, will have a capacity of 150 beds for the exclusive use of cardiovascular patients. It will be in condition also to give special attention to patients suffering from chronic rheumatoid arthritis. Because of a lack of space, it is not possible to go into details regarding its organization; however, it will have a department of physical therapy specialized along the same lines, which will function according to the following plan: A section of hydrotherapy, equipped with two carbogaseous baths, a Scotch shower and a lighted cabinet, and another section, with an artificial fever cabinet, diathermy apparatus, galvanic current generators for ioniza-

tion, a plethorator and a suction and pressure appartus. In addition, it will have special Sanders oscillating beds installed in the patients' rooms.

Already in operation are plans for the erection of five general hospitals, strategically distributed throughout the republic, to carry on the work, and each will have its department of physical therapy.

Since the preparation of personnel is a basic point in every organization, it is imperative to teach the fundamental principles, the indications and the limitations of physical therapy. The creation of a school for technicians is urgent, as is also the establishment of a more complete course for the students of the regular school of medicine.

By way of a beginning, there is already a group of registered nurses who will soon begin a short training course. In fact, a few of these nurses have already taken training in the specialty to which the hospital is dedicated, and they have been assigned to various sections, for example orthopedics, pediatrics and surgery. In this manner an effort is made to provide the technical personnel of the physical therapy departments with knowledge not only of this sort of work in general but of the management of patients within a given specialty.

Nurses who have not been specially trained in a particular branch of medicine will be expected to have a year's practice in an officially recognized hospital and to present a good record of work.

The medical personnel which is to be in charge of these physical therapy departments will be the object of careful preparation and selection. Postgraduate courses will be organized, and the services of those who have taken special courses abroad will be especially solicited.

Conclusions

1. It is hoped that during the coming year the number of patients treated in the General hospital can be increased threefold, once this important service is reorganized with complete personnel and sufficient equipment.
2. The attention given the patients will be more adequate and more scientific as a result of the careful training of the personnel in charge of the work.
3. As other medical centers are organized, specialized departments of physical therapy will be created, which, without doubt, will offer great benefits by virtue of their specialization.
4. We shall have in the near future a school for technicians, which will make possible the extension and the improvement of the hospital services. At the same time it will serve as a stimulus for a new career and will create greater respect for this branch of medicine.
5. Gradually new appropriations from our hospital budgets will be made in order to pay better salaries and thus attract a more select personnel.

ARTIFICIAL NEGATIVE AEROIONIZATION

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It was alone that I undertook, in 1919, in Moscow, my first experimental biologic investigations on the action of unipolar ionization. I was resolved to make clear the role of the absolutely unipolar ions. My work proceeded irregularly until the end of 1921. At that time I had at my disposal a fairly well equipped laboratory. In 1922 I began to study the influence of ionized air on the motive and sexual activities of animals. This work, in addition to the essential deductions derived from the experiments, established the fact that negatively ionized air is a prophylactic and therapeutic factor that stimulates the organism and increases its vital activities.

My investigations have demonstrated that negative aeroionization in definite doses has definite physiologic effects on animals; it excites their vital activities, their motive power, their appetite and their libido. Positively ionized air in the same doses generally has the opposite effects. Large doses of positive ions cause, in a short time, depression, sudden lassitude and asthma. These results seem to corroborate a theory of long standing, that negative franklinization is stimulating and positive franklinization depressing to the organism.

My next experiments, which I performed both on experimental animals and on human beings from 1926 to 1929, convinced me of the beneficial action of negative ionization on the organism. I was encouraged to apply ionization to the culture of plants, to cattle raising, to veterinary medicine and to medicine. In 1930, with my collaborators I was able to engage in investigations on a large scale. These were entirely on an industrial basis, being concerned with poultry, pigs, rabbits, cattle, bees, plants, seed and many other biologic subjects. Thanks to these extensive investigations, we are now in possession of an important documentation.

At the end of 1931, subsequent to a decree of the government of the Union of Socialist Soviet Republics, I organized a central laboratory of research on ionization.

It must be pointed out that we used but a single method for obtaining ionized air. After having studied a number of means of securing unipolar ionization (ultraviolet light, roentgen rays, electrical discharges) I chose the electric effluvium (effluvium of the current of high tension of the points). Deleterious gases (nitrogen, etc.) are not produced if certain conditions are observed. It is of great importance to indicate that, while our apparatus affects the electric field, the physiologic action of this field is unimportant. My numerous investigations, indeed, demonstrated that the active physiologic factor was the ionized air, while the role of the electric field was nil.

As in any other new scientific field, there were a number of aspects that could not be made entirely clear. Others, however, and among the most important ones, called for immediate study and closer examination.

Study of the physiologic action of artificial ionization of air enabled me to work out a tabulation of the changes in the functional activities of the various organs and systems.

Some ten years ago it occurred to me that ionized air when it reaches, during the process of breathing, the pulmonary alveoli is bound to exercise

some specific action on the blood. It would be strange indeed if the electric charges that throng toward the alveolar wall, which consists merely of endothelium provided with a fine stratum of capillaries, produced no action whatever on the blood streaming through the capillaries. In 1925 I engaged in a systematic study of this problem and in the course of tests on guinea pigs I observed two important phenomena: An increase in the hemoglobin content (as compared with that of control animals) and a slowing down of the sedimentation rate of the erythrocytes. These observations were confirmed by my investigations during the period 1927 to 1930. Later (1931 to 1933) I noticed a similar slowing down of the sedimentation rate of the erythrocytes in hospital patients with pulmonary asthma, pulmonary phthisis and a great number of other diseases, particularly those of the vegetative and endocrine systems.

Finally, in 1932, Dr. R. I. Landa Glass performed, at my request, some special minute investigations in this field. According to this author's data, in animals the precipitation of hematins slowed down in response to the action of negative ions of the air (aeroions) and, on the contrary, quickened in response to the action of positive aeroions. On the strength of the theory of precipitation of the hematins as formulated by Professor Hober, as further developed by a numerous group of his followers and as now generally accepted, this means that the negative aeroions increase the natural negative charge carried by the surface of the erythrocytes, whereas the positive aeroions lessen it. As known, the intensity of the charges of the hematins is to a considerable extent dependent on the electrochemical state of the colloids of the blood plasma. It was therefore possible to foresee a change in the natural charge (negative itself) of the colloids of the blood, this in proportion to the change in the charge of the erythrocytes. This fact was established by the works of Dr. Landa Glass. In the rabbit, under the action of positive aeroions the coagulation of the colloids in the blood serum in the presence of albumin (Mateffi-Brulova reaction) produces flakes with insignificant concentrations of albumin. In other words, the serum colloids become more labile. Under the action of negative aeroions, the serum becomes, on the contrary, more stable; that is, it ceases to coagulate much sooner than control serum from the same rabbit. We thus arrived at the following conclusion: The natural negative charge both of colloidal particles of the blood serum and of the essential elements of the blood (the hematins) rises under the action of negative aeroionization and drops under that of positive aeroionization.

The problem of the influence exercised by negative ionization on the quantitative composition of the white blood cells was studied by Kaufman and his collaborators during 1932-1933. They demonstrated that the influence of aeroionization on these cells results in leukopenia followed by an increase of leukocytes. The differential count shows an increase in the percentage of monocytes. These authors also observed an increase in the percentage of pseudoeosinophils and a change in the percentage of the lymphocytes.

According to the majority of the investigators, the number of red cells unquestionably increases in animals, as it does in human beings, under the influence of negatively ionized air. Tests performed at my laboratory on pigs, cows and rats, as well as observations on patients treated with ionized air, agreed in showing an increase in erythrocytes.

A review of the results obtained in study of the effects or ionized air on the morphologic composition of the white and of the red blood cells led to the conclusion that ionization exercises a definite action on the medulla

and on the entire reticuloendothelial system, accelerating the erythropoietic process and the stability of leukopoiesis.

Also of great interest are the observations of the effect of ionized air on the hemoglobin content of the blood. In 1925 I observed an increase of the hemoglobin in guinea pigs exposed to the action of ionized air, a finding which was frequently confirmed in the course of tests performed (in 1932) on cows, tuberculous rabbits and rats. My collaborators observed nearly the same phenomenon during the tests performed on suckling pigs.

I also wish to mention the increase of the catalase in the blood of cows and of rats which is produced by systematic aeroionization.

While discussing the action of breathed-in aeroions on the blood, I wish also to mention the change undergone by the mitogenetic radiation of the blood under the influence of positive and of negative aeroions. It has been firmly established in my laboratory that negative aeroions stimulate this radiation, whereas positive aeroions moderate it. It has also been established that deviations in the *p*H of the blood occur under the influence of the same factors: The negative ions shift the *p*H of the blood toward the alkaline side.

Finally, special tests were performed which demonstrated that soon after a treatment by inspiration of ionized air, the agglutination titer of immunized rabbits increases noticeably and remains high for a fairly long period.

In summary, study of the effect on the blood of the action of ionized air allows one to draw the following conclusions: Negatively ionized air stabilizes the blood, while positively charged air upsets the stability of the blood colloids. Negatively ionized air strengthens the erythropoietic process and either stabilizes or reduces leukopoiesis; in other words, it produces a definite effect on the reticuloendothelial system. In most cases one observes an absolute increase, while in other cases one notices a drop, in the absolute quantity of the hemoglobin.

Changes in the functioning of the cardiovascular system due to the action of breathed-in negative aeroions have been observed by me and my collaborators. We discovered a beneficial action on respiratory arrhthmia and on tachycardia in cases of compensated myodegeneration. Happel has recently studied the action of ionized air, both positive and negative, on the pulse. According to this author, negative aeroionization seems to decrease the number of cardiac contractions, while positive aeroionization seems to accelerate the beating of the heart.

Of especial interest were the results obtained by my assistants and me in regard to hypertension. We were the first to establish the fact that ionized air produces an interesting result in cases of essential hypertension. The same problem was studied later in detail by Strasburger and Happel. These authors established definitely that in 60 per cent of cases of hypertension, inhalation of negatively ionized air results in a sudden drop of the blood pressure. Hypertension during the climacteric was lowered to normal and remained normal for a fairly long period in 91 per cent of the cases. The blood pressure of healthy persons reacts to the inhalation of negatively ionized air by a drop of 5 to 15 mm. of mercury, though it returns to normal at the end of the inhalation. Positively ionized air has no noticeable influence on the blood pressure of the healthy; it causes, however, headaches and discomfort. The influence of artificial aeroionization on the activity of the cardiovascular system has been confirmed of late by a whole group of authors.

The respiratory function and, consequently, the gaseous exchanges are closely connected with the activity of the cardiovascular system. As early as 1901, Aschkinass and Caspari, while observing the symptoms of mountain

sickness, concluded that it must be due to excessive ionization of the air. At the same time they observed that in localities favoring mountain sickness positive ions are in much more numerous than negative ions. These early observations have been confirmed time and again by investigators in mountainous regions.

Numerous observations made by my collaborators and me (1929-1930) have demonstrated that ionized air brings about definite reactions in the respiratory apparatus, expressed in an increase or decrease in the number of respiratory movements. Negatively ionized air in most cases slowed down and calmed the respiration; positively ionized air, on the contrary, accelerated it. Tests on healthy persons by Happel (1931) led him to similar conclusions. Positive ionization produced phenomena analagous to those one observes in case sof respiratory difficulty due to lack of oxygen.

One can cite numerous observations made on human beings and animals suffering from alkalosis and from various neuroses revealed during electrometeorologic perturbations, to which these phenomena are attributed by many authors (Caspari, Bettman, Zuntz and others). Furthermore, it has been established by different authors that negative aeroionization increases the alveolar tension of carbonic gas, while positive aeroionization decreases it (Edstrom). All these observations lead to the belief that ionization of the air exercises a definite influence on the respiratory function, positive and negative ionization bringing about contrary reactions.

In speaking of gaseous exchanges one cannot fail to touch on the action of ionized air on the general metabolism of the organism. I have made numerous observations on this action and published the first articles demonstrating that negatively ionized air increases the general exchanges of the organism. It was while studying the action of ionized air on the functional state of the nervous system that I happened to discover an increase of the metabolism in rats. Subsequently experiments with rats and guinea pigs, as well as the observations made by Utz, Sokolov and Mikhin on human beings and those made afterward by Prozorovsky, Benak, Kijishovsky and Belenkii on rats and pigeons, fully confirmed my initial observations. Dolgikh, Perov and Skvortzov observed a whole series of phenomena of the greatest interest concerning the exchange of matter in cows, phenomena they ascribed exclusively to the action of ionization, which they regard as a factor stimulating exchanges in the organism. Happel has also observed the action of ions on the metabolism.

On the strength of observations he made on exophthalmic goiter, Happel stressed the fact that the inverse action of negative and of positive ions on the essential exchanges is clear. The same author also observed the effect of ionization, positive and negative, on the diuretic phenomena. Negative ionization increases the average quantity of urine in twenty-four hours, whereas positive ionization lessens it. Finally, there is the influence of aeroionization on the metabolism of water and salt in the human organism—as brought to light by Prozorovski—when this metabolism is disturbed (Quincke's edema, anasarca, urticarial edema, etc.).

The greatest number of observations on the action of ionized air have to do with the dynamics of the development of the organism.

In my first investigations concerning the action of ionized air on animals, I observed that rats exposed to systematic action of negatively ionized air grew more rapidly, exhibited finer coats, looked more robust, gained weight more rapidly and aged less quickly than control rats. Finally, their offspring were handsomer and more numerous.

These first results (1919 to 1924) were confirmed by my subsequent in-

vestigations, and by those of my collaborators, in experiments on various animals and birds and eventually on human beings (1925 to 1933). An account of all of our investigations of the action of negatively ionized air on the energy of growth would be too long for this article. I shall therefore confine myself to a brief enumeration of the results achieved.

Tests performed by us on poultry (1931-1932) demonstrated that negatively ionized air brings about a quick increase in weight in comparison with the weight of control animals. The same result was obtained in our experiments with cows, suckling pigs, sheep and rabbits. The effect on growth and weight was especially marked in animals and birds which were feeble and not well developed and was slight in normal animals and birds.

It was demonstrated that ionized air acts also as a stimulant of various physiologic functions: Sexual, lactiferous, wool-growing and so on. The systematic observations which my assistant Kirmiakov and I made on the egg laying of hens brought to light facts that can be placed in the category of phenomena of sexual activity as stimulated by ionization. Minute experiments concerning the sexual habits of pigs (Annenski), sheep (Golubev), cows, rabbits and rats fully confirmed my first observations. One can even assume that the sexual habits of bees are influenced by the degree of ionization of the atmosphere (observed by Kajevnikov and myself). Many investigators have observed an increase in the sexual activity of human beings under the influence of systematic ionization (Mikhin, Ulz, Sokolov and others). Ionization brought about a definite increase in the milk-yielding function (Skvortzov) of cows. Tchubarov obtained brilliant results as regards the activity of the lactiferous glands of women under the influence of ionization. His observations on wet nurses treated systematically with ionization led to the conclusion that aeroionization exercises a powerful influence on lactation.

Finally, there have been numerous observations concerning the growth of hair in animals and in human beings.

All the observations mentioned clearly establish the influence of aeroionization on the endocrine system. Indeed, the special observations made on human beings demonstrate clearly the action of ionization on the thyroid body, the hypophysis, the adrenal glands and the ovaries. This action is more powerful when the activity of these glands is feeble, and it consists mainly in readjustment of their synergetic activity.

My collaborators came to the conclusion that negative aeroionization exercises a most favorable influence on functional diseases of the vegetative system. But this system is not the only part of the nervous system that reacts to aeroionization. Between 1919 and 1922 I observed in animals exposed to the action of ionized air a change in the motive power and in the degree of excitability, as well as a number of subjective phenomena, such as agitation or depression. These same phenomena were observed by my collaborators in the course of tests on animals and poultry. Similar phenomena have been observed more recently by Janitski, Happel and others in human patients. From these observations one must conclude that negatively ionized air contributes to a state of euphoria and intensification of motive activity. Positively ionized air, on the contrary, brings about a feeling of fatigue and languor.

The controlled tests of Happel on the psychophysical reactions of human beings under the influence of negative and of positive aeroionization in the acoustic and optical domains demonstrated the beneficial action of negative ions in decreasing the number of errors.

The work of Edstrom on the influence of negative and positive ions of

air on the nervous functions well deserves attention. This author used the method of Dessauer (production of ions) in relation to the chronaximetric method of Bourguignon. He demonstrated that negative ions shorten the chronaxia, that is to say that they increase the excitability of the neuromuscular apparatus, whereas positive ions lengthen it, in other words cause a decrease of excitability. Edstrom's observations were confirmed and further investigated by Ufland and Vaula. These two authors obtained regular deviations not only of the motive chronaxia but of the sensorial chronaxia (1933).

One must bear in mind that the organism is benefited only by definite doses of ionized air, and chiefly of negatively ionized air. Too large doses bring about opposite results. Experiments performed with animals, insects and protozoa have demonstrated how easy it is to cause a stoppage in growth by excessive doses.

One should point out that ionized air seems to exercise an influence on micro-organisms in vitro closely related to the influence of electricity in the atmosphere on epidemic diseases and on the development of disease.

In short, ionized air acts on many of the physiologic functions of the organism: Hemopoiesis, activity of the blood, activity of the cardiovascular system, general metabolism, cellular division, phenomena of growth, activity of the endocrine glands and nervous and neuropsychic functions. Thus, one is bound to come to the conclusion that aeroionization exercises an influence on the entire organism; in other words, that it possesses universality of action. As long as the organism remains in a physiologically normal state, ionized air in definite doses causes no sudden disturbance but merely contributes to a general metabolism, favoring the dynamics of growth. But when the organism experiences some trouble in the functioning of any of its organs or systems, aeroionization assists in mobilizing the protective mechanisms and in bringing the disturbed equilibrium back to a state of relative stability.

I do not think I am mistaken in saying that polarity is a characteristic feature of the physiologic action of aeroionization. There is no doubt that negative ionized air and positively ionized air exercise influences on the organism and its functions which are not always the same and are often inverse. Next to universality and polarity, specificity must be recognized as the third characteristic feature of the action of aeroionization. It is not merely by the general and by the special reactions of the organism that the specificity of the action of aeroionization is made evident; histologic investigations confirm the existence of a specific action of ionization on various tissues and organs, an action entirely different from that of roentgen or ultraviolet rays.

Another distinctive feature of aeroionization is its periodicity. By exposing biologic subjects (birds and seeds) to the action of the ions of the air, I demonstrated that the stimulating doses and the checking doses follow each other alternatively, the curve of the action of aeroions having a zigzag outline. Phenomena of this kind appear in the course of certain physiochemical processes, but they have not yet been satisfactorily explained.

The lasting action of ionization must be considered its final constant and obvious characteristic. This action preserves its efficiency for months, perhaps even for years, according to the nature of the function of the organ that is being "charged" by aeroionization.

I have tried to give here a concise review of the abundant documentation we now possess concerning the therapeutic and physiologic action of artificial aeroionization. This documentation, which forms the basis of our

theories, was gathered by my collaborators and me during ten years of patient research. Later we could think of building a synthesis of the whole of our knowledge in this field. In 1932 I invited my friend Prof. L. L. Vassiliev to come in the capacity of consultant and examine with me our voluminous material, and afterward we were able to formulate a number of theories concerning the mechanism of the physiologic action of the aeroions.

Bibliographies

A complete list of the scientific works on the problems here discussed have appeared in the volumes I, II and III of the works of the Central Laboratory of Ionization, Problems of Ionization (Director: Prof. A. L. Tchijevsky), Moscow.

SUSTAINED INTERNAL RADIANT HEAT IN LESIONS OF THE PELVIS *

BENGT NORMAN BENGTSON, M.D. **
MAYWOOD, ILLINOIS

Thermotherapy in some form has been employed for lesions within the female pelvis since the time of Hippocrates. Yet even after the middle of the nineteenth century most physicians either evidenced a disinterest in or else condemned as dangerous all forms of intravaginal heating procedures. It remained for a few investigators to persist in experimentation and to carry out new and varying technics in the hope of attaining improved clinical benefit. And because of the tenacity of purpose of these pioneers, gradually the more simple forms of vaginal vault heating, especially prolonged hot water douchings, either with or without incorporated medication, began slowly to be accepted by the medical profession.

After the turn of the twentieth century, Elliott introduced a method that obtained a higher and a much more sustained heating of the female pelvis by distending the vaginal vault with an elastic rubber bag and supplying an ingeniously heat-controlled circulating water supply. He reported excellent clinical results from this therapeutic innovation and a rising enthusiasm swept the ranks of organized medicine. The literature quickly became enriched with the experiences of a score of other investigators and also with the impressive and unstinted clinical approval of our foremost gynecologists and surgeons.[1-13]

Today there are few physicians who oppose pelvic heating as a form of therapy.

Tungsten and carbon filament lamps or other forms of infra-red radiation units have almost completely replaced the old-fashioned hot water bag as a means of securing a more effective penetration of heat into the surface tissues of the body.

It occurred to me that use of a lighted tubular electric bulb, if inserted intravaginally should likewise prove superior as a heating agent to those methods that employ rubber bags and utilize conduction forms of heat for therapeutic purposes.

I found that a 25 watt tubular type bulb could be inserted easily into the average vaginal vault. Considerable experimentation with heat control and other

* Read at the Twenty-first Annual Session of the American Congress of Physical Therapy, Pittsburgh, Pa., September 12, 1942.
** In Active Service.

protective devices was necessary before a safe routine of therapy could be effected. For example, a ground-free current had to be used, in addition to low wattage and low voltage, so that it would be impossible to shock the patient electrically during treatment.

Description of Unit

The final radiating element found to be the most satisfactory consisted of a special filament enclosed in an ordinary tubular light bulb, which when in opera-

Fig. 1. — Assembly of entire unit.

tion distributed its heating energy almost equally into all portions of the vaginal vault. It was also deemed advisable to house this special light bulb within a sturdy glass speculum to protect the patient against any possibility of injury from bulb breakage during therapy (fig. 1). A voltage regulator was constructed

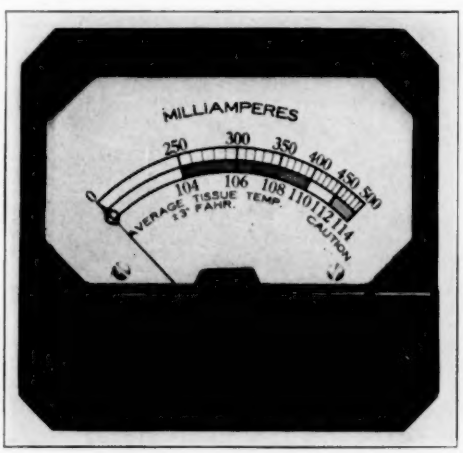

Fig 2. — Milliameter panel showing colored segments.

to indicate both milliamperes of electric energy and, by means of colored segments, to indicate the temperature of the vaginal mucous membrane (fig. 2).

Since the temperature inside the glass speculum drops instantly when the current of the filament changes from higher to lower, it was possible to approach tissue temperatures just under 114 F. without danger of a burn. However by

repeated experimentation it was found that the safest operating range for all patients was obtained when the meter registered 320 milliamperes, while the maximal comfortable tolerance was at 405 milliamperes.

Clinical Observation

There were 31 patients in the first[13a] series. The observation on this series has already been reported.

I cannot in all fairness state that the response of the pelvic lesions in that first series seemed any more rapid than it might have been if a conduction form of heat therapy had been employed. However, one statement can be made definitely: All the patients remained completely comfortable during each of their two hours of treatment. In fact, many indicated that they could easily tolerate double or treble their treatment time without discomfort if to do so would hasten in the resolution of their lesion. In consequence, experiments were begun on other selected subjects to ascertain how long a radiant heat treatment could be given with safety and without undue discomfort. It was found after considerable clinical trial that ten hours seemed to be the optimal period and that the milliamperage could safely be started at 390 and decreased about 20 milliamperes per hour until 280 was reached.

Four patients with pelvic disease were then selected and were started on this prolonged form of intravaginal heating at subcritical temperatures. Three were treated in my laboratory and 1 was treated in her own home. Of these four, one had cystic oöphoritis. One had chronic pelvic inflammatory disease, another had unilateral salpingitis following an acute gonococcic infection and the last had bilateral nonspecific chronic salpingitis following childbirth, for which operation had been advised. Each patient had ten hours of treatment daily with a milliamperage range from 280 to 400.

A report of a typical case follows:

R. M., a white woman, aged 24, a nullipara, complained of incapacitating pains in her right groin. The history revealed that three months before there had developed a discharge, burning on urination, chills and fever, with a temperature of 104 F. She did not, however, seek medical aid for about a week. The physician who examined her then told her that she had a venereal infection and that it was in her fallopian tubes. He gave her sulfathiazole and local treatment. The discharge did not seem to lessen, nor did the pain in her right groin improve. The physician then advised surgical intervention. The patient sought other medical advice, and again the physician consulted advised surgical intervention, diagnosing the condition as pus in the tubes from a venereal infection.

The patient was seen at my office on Dec. 18, 1941. Her temperature was 99 F., her pulse rate 92 and her blood pressure 108 systolic and 60 diastolic. She claimed to have lost 12 pounds in two months. The abdomen was flat and moderately tender, and a Murphy reflex was noted in the right lower quadrant. There was severe endocervicitis, with an attendant profuse mucopurulent discharge. (All smears studied were negative for the gonococcus.) Bimanual examination revealed that the uterus was normal in size although very tender and slightly displaced to the left. A mass the size of a golf ball was felt near the right cornu. This mass proved to be a tube and was exquisitely tender. The diagnosis was right tubal abscess. Surgical intervention was advised and refused. On December 18 the patient was started on radiant therapy, but cautiously and for only one hour at 300 milliamperes. Another treatment was given for one hour on December 19 at 350 milliamperes. Each day from this date the treatment time was increased by one hour until ten hours per treatment had been established. On December 25 the patient stated that her side had improved about 50 per cent. Bimanual examination confirmed a decrease in the size of the right tube of about 30 per cent. The Murphy reflex was 50 per cent better, although the tenderness to deep pressure was about the same. The discharge was profuse during and for a number of hours after each treatment but otherwise had lessened considerably. On the fifteenth day of radiant heat treatments (Jan. 2, 1942) the patient stated that she felt fine. The discharge had decreased, although there still was considerable during and for a few hours after each treatment. The right tube had decreased a total of 50 per cent in size. On the twentieth day (January 7) the tem-

perature was 98.4 F., and the patient stated that she felt fine. There was no Murphy reflex and little tenderness. There was no discharge. The endocervicitis had improved 75 per cent.

The treatments were decreased to three a week. One week later the patient had no complaints. The right lower quadrant was not tender, and bimanually the right tube was barely palpable and not tender. The treatments were reduced to two a week for one week. At this time, thirty-four days from the beginning of the treatment, the right tube could not be felt bimanually. There was neither internal nor external abdominal tenderness. The patient was dismissed for a month without treatment. At this time, after a total of sixty-five days of treatment, there was no complaint objectively or subjectively.

Results of Sustained Radiant Therapy

The patients with chronic inflammatory pelvic disease, with unilateral salpingitis and with bilateral nonspecific chronic salpingitis seemed to respond to the prolonged radiant therapy by a rapid convalescence. The patient with cystic oöphoritis showed no change.

The resolution of the induration about the pelvic lesions in this small group with sustained therapy seemed to be more rapid than in the previous series, in which the individual treatments lasted only two hours.

Comment

A progressive hyperemia at any site of infection is nature's own method of attempting to overcome the invasion force. This hyperemia, with its attendant acceleration of circulation, combats stasis and swiftly carries waste products and other toxic substances away from the infective region through the venous stream. This physiologically induced reaction facilitates, also, a rapid transportation of effective fighting forces within the arterial stream to the combat zone.

The circulation about the various orifices of the body is such as to be peculiarly adapted to resist, and usually successfully, most engagements with the common infections. The vascular pattern surrounding the vaginal inlet is, of all the orifices, probably the best equipped to establish a swift and complete hyperemia in the event of bacterial attack.

The vagina, the uterus and its adnexa are completely enveloped in and by blood vessels and also by a most complicated lymphatic drainage system (figs. 3 and 4). The vagina itself can be said to have an independent blood supply derived from the pudendal branches of the internal iliac arteries, as well as from direct branches of hypogastrics, becoming an interlacing network of supply. There is further a direct interosculation between this network and the uterovaginal plexus. Nor does this maze of intercommunicating vessels end here. The pampiniform plexus is vastly larger in the female than in the male and communicates freely with the uterovaginal plexus, directly from the ovarian circulation and, finally, of course with the inferior vena cava on the right and the renal blood supply on the left side of the body. Even the mucous membrane of the vaginal vault is richly endowed with a completely encircling web of fine arterioles, which receives its blood supply from the vesicular, vulvar, hemorrhoidal, perineal, and even the coronaries about the cervix and then of course, larger branches from the uterovaginal plexus itself.

Thus any infective agent that attempts to pass from the vulva to or into the vaginal vault is met with a prompt and efficient hyperemic reaction. Any lesion above the level of the cervix, in the uterus or the adnexal region, usually does not induce a primary hyperemia of the mucous membrane of the vaginal vault. But, if through artificial thermal reaction an active hyperemia is created in the vaginal circulation, because of its intricate ramifications with the uterine and adnexal circulation a profound influence in the latter area can be established.

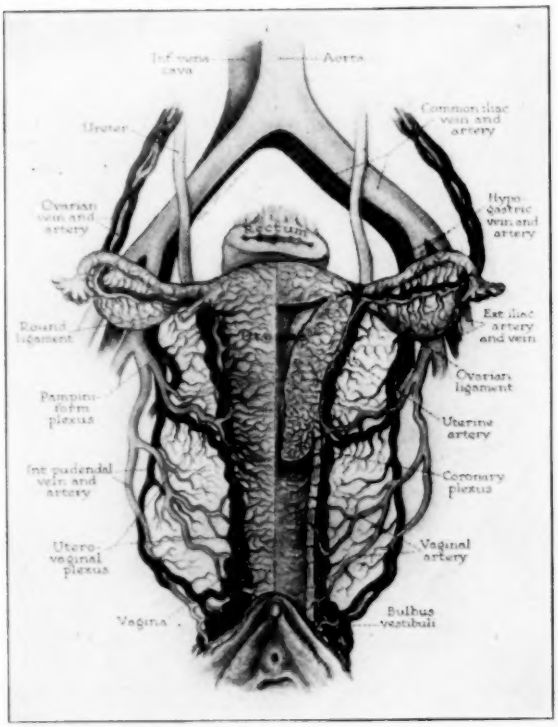

Fig. 3. — Blood vascular supply to ovaries, uterus, Fallopian tubes and vagina.

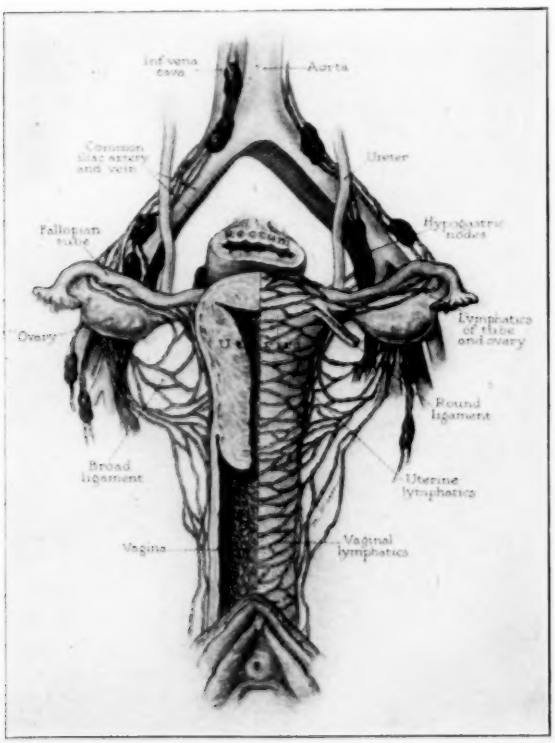

Fig. 4. — Lymphatic glands and vessels of ovaries uterus, Fallopian tubes and vagina.

Thus thermogenesis within the vaginal vault should under certain conditions prove highly valuable in assisting the overcoming of an infection that might have become entrenched in the uteroadnexal region. And once with help the infective lesion itself is under control, further induced thermotherapy could be an adjuvant in hastening more rapid and complete resolution.

But thermogenesis alone should not be the sole motivating force behind vaginal vault heating procedures. Instead, an approximation of nature's own methods should be effected, to wit an active, prolonged acceleration of the circulation in the area immediately involved. There need be little if any hyperemia in contiguous connective tissues, adipose stratas or subcuticular layers at or near the body surface. This reaction should appear slowly or rapidly, depending on need, and should remain in force until subsidence of the infection. For example, a furuncle may evidence a violent hyperemic and even indurative reaction at its site of bacterial invasion for a day, a week or a month, whereas half an inch or 1 inch away the circulation may not be the least disturbed or show any evidence of even passive congestion unless mechanically induced. Hyperemia, then, when induced by nature to combat the penetration of infection is a local procedure of short or long duration, involving usually only the area that is being invaded. Without intending to disparage in the least other valued contributions to the subject of pelvic thermotherapy, I believe that those methods that compress the highly important superficial and complicated vaginal circulation by distention, for example with an elastic bag, and then utilizes for short periods only a superficial means of heating this mechanically created hypoischemic surface defeat a great deal of their objective. The circulation of the vaginal vault when uninterrupted is beautifully adapted to accept and to disperse into the uterus and adnexa large volumes of heat rapidly and for probably unlimited periods of time. This being true, some form of vault heating should be instituted that has highly efficient blood stream heating qualities, does not have to rely on distention of the vaginal vault for results and can be maintained for long periods and without danger and without discomfort (fig. 5). It is my belief, after considered thought, that radiant energy meets these qualifications both theoretically and practically, at least presenting advantages over present methods, which rely mainly on conduction.

Considerable investigation has been done by authorities relative to the superiority of radiant energy over conduction forms of heating. Krusen[14] stated that if heat penetration of tissue is desired it is best to use a luminous heat source. Sonne[15] stated that the point of tolerance of cutaneous temperature with luminous rays is 43.5 C. But "this temperature does not decrease with tissue depth, but gradually rises . . . whereas (referring to non-radiant heat) the highest tolerable skin temperature is 45.5 C. and the temperature decreases in direct proportion to the depth of the tissue." Peck[16] expressed the opinion that heating of the blood stream can best be produced with a tungsten filament lamp. Mayer[17] claimed that infra-red rays longer than 1,400 millimicrons are more likely through their superficial absorption to produce cutaneous blisters than those shorter than 1,400 millicrons (near infra-red and luminous), which penetrate. McKee[18] confirmed this assumption that far infra-red rays may cause severe burns without producing the desired therapeutic effect. Hardy and Muschenheim[19] stated that "all observers agree that it is only within the near infra-red range that any appreciable penetration of the skin occurs and that this can be easily reached by a tungsten filament bulb."

Bachem[20] has given actual figures for the penetration through and the absorption by the various cutaneous and subcutaneous layers of light of different wavelengths, with the result that the spectral range from red to infra-red secures the greatest relative depth heating.

The therapeutic merit of radiant heat is due mainly to the emission of short infra-red waves and their absorption by the pelvic tissues.

It has been variously stated that radiant heat, having greater penetrability into tissues than other heating, presents a certain hazard when used early in acute infections.

This hazard could come from the dangerous increase in circulation about the lesion to a point that might prevent the usual protective induration that isolates the infection. Further, because of the resulting increase in vascularization, infection from the focus itself might conceivably be allowed into the blood stream and thus to other parts of the body. It is probably true that in the very earliest stages of any infection—penetration, natural processes should not be in-

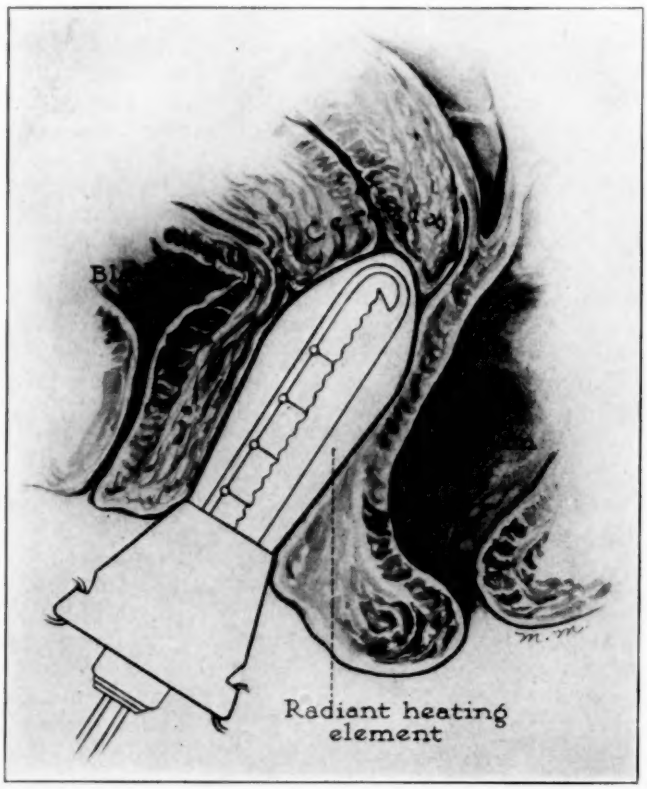

Fig. 5. — See text.

terfered with by any form of artificial thermotherapy. The tempo of physiologic resistance to any invading force is in all probability gauged by the swiftness and the fury of the attack. It is logical that even if radiant heat were actually not harmful at this point, it might conceivably upset the balance of effectivity that decides whether a barrage of induration about a lesion is as vital as thorough vascular hyperemia. Therefore I feel also that radiant heat could present certain disadvantages and possibly even dangers if used during the immediately acute stage of any infection. For that matter, I feel that even conduction forms of heating also present similar if not as great hazards. But once natural forces have established barriers, walling and isolating the infection, it would seem that

any dangers attendant on radiant therapy would be immeasurably lessened and the benefits incalculably increased. By the time the usual case of pelvic inflammatory disease becomes available for intravaginal thermotherapy, it is either subacute or chronic and entirely safe for any standard physiothermal procedure.

Summary

The pelvic heating unit described utilizes radiant energy as the heating medium. The entire unit weighs less than 10 pounds and can easily be transported. An individual treatment can be maintained for ten hours with safety and with comfort. The patient is able to assume almost any conventional position during the therapy, and most of the series described slept from four to six hours per treatment. The patient may change from the supine to the prone position without the speculum being either removed or disturbed.

Because there are no intricate parts necessary to establish and to maintain variations of temperature, the original cost of the unit as well as of replacement of parts should be low. The life of the bulb should compare favorably with that of an ordinary light bulb.

I believe that the unit described is the simplest, safest and most effective device offered at the present time for the heating of pelvic tissues. There is no discomfort from distention by bag application and no danger of necrosis from prolonged pressure.

References

1. Counseller, Virgil S.: Treatment of Chronic Infection of the Pelvis: A Consideration of the Elliott Method, J. A. M. A. **101**:916 (Sept. 16) 1933.

2. Doan, R. C. and Simpson, W. M.: The Elliott Treatment of Pelvic Inflammatory Disease, Am. Surg. **28**:78 (April) 1935.

3. Holden, F. C., and Gurnee, W. S.: The Elliott Treatment, A New Method of Applying Vaginal Heat, Am. J. Obst. & Gynec. **22**:87 (July) 1931.

4. Jacobs, R. G.; Vaughan, J. R., and Gellhorn, G.: Preliminary Report of Pelvic Inflammatory Diseases Treated by the Elliott Method at the St. Louis Hospital, Bull. St. Louis City Hospital **25**, (June 5) 1931.

5. Gurnee, W. S.: Gonorrhea in the Adult: Elliott Treatment and Hyperpyrexia, Am. J. Surg. **33**:500 (Sept.) 1936.

6. Randall, D. M., and Counseller, V. S.: Treatment of Pelvic Inflammation by Heat: Indications and Results, Minnesota Med. **18**:1 (Jan.) 1936.

7. Preece, A. A.: The Elliott Heat Treatment in Pelvic Infections, M. Ann. District of Columbia **4**:38 (Feb.) 1936.

8. Counseller, V. S.: Conservation in Gynecology, S. Clin. North America **15**:1309 (Oct.) 1935.

9. Sanders, J. T., and Sellers, T. B.: Treatment of Acute and Sub-Acute Infection of the Pelvis with Special Reference to the Elliott Treatment, New Orleans M. & S. J. **87**:368 (Dec.) 1934.

10. Dearman, A. M.: Elliott Treatment in Pelvic Infections, West Virginia M. J. **32**:358 (Aug.) 1936.

11. Emmett, J. L.: Elliott Treatment of Chronic Urethritis of Women: A Preliminary Report, Proc. Staff Meet. Mayo Clin. **10**:135 (Aug. 28) 1935.

12. Counseller, V. S.: Heat in Treatment of Pelvic Inflammation, Surg., Gynec. & Obst. **58**:239 (Feb.) 1934.

13. Michel, L. I., and Taube, N.: The Elliott Method of Treating Pelvic Infections in the Male and Female, Urol. & Cutan. Rev. **34**:237 (Apr.) 1935.

13a. Bengtson, B. N.: Internal Radiant Heat in Lesions of the Pelvis, Arch. Phys. Therapy, **41**:711 (Dec.) 1941.

14. Krusen, Frank: Light Therapy, New York, Paul B. Hoeber, Inc., 1933.

15. Sonne, Carl: Investigation on the Action of Luminous Rays and Their Mode of Action, Arch. Phys. Therapy **10**:98 (March) 1929.

16. Peck, W. S.: The Therapeutic Application of Visible and Infra-Red Radiation, Internat. Clin. **2**:197 (June) 1932.

17. Mayer, Edgar: The Present Status of Light Therapy, J. A. M. A. **98**:221 (Jan. 16) 1932.

18. MacKee, G. M.: Ultraviolet Therapy in Dermatology, J. A. M. A. **98**:1553 (April 30) 1932.

19. Hardy, J. D., and Muschenheim, C.: Radiation of Heat From Human Body: Transmission of Infra-Red Radiation Through Skin, J. Clin. Investigation **15**:1 (Jan.) 1936.

20. Bachem, A., and Reed, C. I.: Skin and Radiation, Arch. Phys. Therapy **12**:581 (Oct.) 1931.

Discussion

Dr. Madge C. L. McGuinness (New York, N. Y.): To those of us particularly interested in quickly clearing pelvic inflammation, a method of prolonged heating with comparative comfort will be heartily welcomed. While diathermy, with long or short wave, has been given for a matter of hours, with and without general hyperthermy, the patient cannot move about freely and frequently grows restless.

This new method seems simple and can be used anywhere with apparent safety judging from Dr. Bengston's results. Moreover, I am delighted to know that the doctor has so many patients who will let him treat them for as long as ten hours. Most of the highly nervous cases we see are greatly disturbed at having to spend even a short time. But then many of our cases are the kind with nothing to do and all day to do it in who are constantly rushing from one foolish engagement to another and have little or no time to spend with a physician in search of health. We will be glad indeed to concentrate on some steady ones and compare results at a later date.

On the historical side, we have come a long way in the treatment of pelvic inflammation. One of the first cases I remember, as a student in a gynaecologic clinic, was a patient with gonorrhoea, whom we treated by packing the vagina daily with bandages wrung out of as hot water as she could bear. Hers was an early case and her symptoms cleared up shortly. In private practice we gave 6 to 10 gallons of hot bicarbonate douches daily, with hot sitz baths, with good results. This was in the days when most hospitals and especially the clinics had no diathermy machines and little was known by the heads of departments of their beneficial effects. The introduction of diathermy made a vast improvement in the prognosis of cases of pelvic inflammation and reduced the number of patients coming to operation and being treated by tamponade.

The Elliott treatment made quite a furore on its introduction and was hailed as the greatest advance yet conceived. Even after the treatment of numerous patients and reports from many others, I still feel that the use of diathermy gives better results, with less danger of burns in its use in ordinary hands. The greatest care has always had to be taken with these modalities and always will be necessary.

The usual experience of cysts being resistent to heat is noted. Dr. Bengston is to be commended for his careful and painstaking studies and I look forward with interest to further success from his special work.

Dr. George Lyford (Cincinnati): May I compliment the essayist on his attempt to explain theoretically and logically the effects of pelvic hyperemia? Needless to say, knowing these cases as most of us do, no scientific diagnosis was made nor was there any proof of the observations other than the subjective symptoms of the patients.

There is no doubt in the mind of those of us who use pelvic hyperemia that it is extremely efficacious in selected cases, but the bases must be diagnosed and the progress of the therapy followed accurately.

The applicator as described by the essayist no doubt does give off infra-red radiation, but infra-red radiation has long since been proved to be a superficial hyperemia, a fact which leaves one in grave doubt as to whether it is an effective agency in treating pathologic changes existing in the pelvis. In my experience it has not been too effective, as compared with conductive heat obtained through the use of Dierker applicators.

The number of case reports is small compared with the some 8,000 which I have seen and it is with difficulty that I attempt to analyze the results of the essayist. Apparently physicians do not realize that other applicators are in use since the dilating rubber bag was developed.

May I again express my appreciation of the attempt of the essayist who presented an intelligent background of the physics of the subject and the physiologic therapy of pelvic hyperemia and express my desire for future data with regard to his observations in a more extensive study when the results of a better controlled series is presented.

Dr. Louis B. Newman* (Chicago): It is rather difficult in the short time allotted to satisfactorily discuss Dr. Bengtson's presentation.

The speaker was kind enough to refer to the Newman Thermo-flo which was devised by me approximately ten years ago for the treatment of pelvic infections and which has since been in continuous use.

The Thermo-flo utilizes automatically controlled heated air which is positively circulated through a thin rubber vaginal bag.

The essayist mentions that in a device of my type the heat produced is transmitted to the tissues through rubber whose conductivity ability is almost as poor as asbestos. This is true if the rubber bag were thick, but, as a matter of fact the bag used, when inflated, is exceptionally thin, measuring less than one-tenth millimeter. Therefore, the resistance to the transfer of heat is negligible. By placing the hand around the bag with the air at operating temperature one soon realizes

* In Active Service.

the efficiency of the heat transfer from the bag to the hand.

Since the beneficial effects of any heating device is due to the hyperemia produced and since the larger surface over which heat is dissipated to the tissues, the greater the resulting hyperemia, therefore, the inflated bag producing distention of the vaginal vault will result in a much larger surface than that possible with a rigid device as described by the essayist.

Counseller, of the Mayo Clinic, in a paper published in *The Journal of the American Medical Association* in 1933 objected to the use of non-distensible electrodes in the vagina because as he stated "the rugae or folds prevent even distribution of heat and render the vaginal mucosa susceptible to burns."

Certainly a thin flexible air-inflated bag which lends itself to the contour of the vaginal vault and weighs less than one-quarter of an ounce would be much more effective and comfortable to the patient than any rigid vaginal electrode.

The essayist stated that the pressure of the air-inflated bag of the Thermo-flo would compress the highly important superficial vaginal circulation which would be detrimental. With the Thermo-flo the thin rubber vaginal bag is inflated to the comfort of the patient and since the anatomical structure of the vaginal tube is such that it permits of remarkable distensibility there is, from a practical standpoint, no appreciable compression of the capillaries. Consider the degree of distention of the vaginal tube when the ordinary vaginal speculum is opened widely, or even better, the remarkable distention during a normal delivery of a full term foetus. The vagina is covered with a thick multi-layer stratified squamous epithelium in which there is no vascular tract, the fine vascular network is sub-epithelial. This extensive sub-epitherial capillary and arteriolar network plus the loose aerolar bed with its abundant amount of elastic tissue fibers permit of unusual distensibility of the vagina, hence relative lack of pressure phenomena from the almost weightless bag to interfere with tissue vitality.

With the Thermo-flo, patients can receive treatment lying on their back or on either side and remain comfortable for hours. There is no feeling of weight or pressure or any discomfort. Even if the bag were to break the small amount of air which may escape the instant the bag breaks will not produce a burn, because of the low specific heat of the air.

Although the electric light bulb of the author's device is considered a radiant emitter, yet most of the energy emitted is in the form of the longer infra-red wavelengths which are identical with the long infra-red wavelengths given off by the heated air bag. Actually, the hyperemia produced in the tissues is due to a definite amount of conductive heating from the glass speculum to the tissues.

It is a fundamental law of physics that any object in contact with another object at a higher temperature is heated by conduction from the object of the higher temperature. To prove this point and show how much the thick glass speculum changes the infra-red radiation into heat, one can take hold of the glass speculum after the current to the filament has been reduced or turned off and find the speculum still retains a considerable amount of heat in spite of the fact that the temperature within the glass speculum may have been reduced. Most everyone has taken hold of the ordinary electric light bulb after the current has been turned off.

Many of the disadvantages brought out in essayist's paper are generally applicable to the Elliott machine which uses heated water, but do not apply to the Thermo-flo which uses heated air.

The Thermo-flo has been used in the treatment of pelvic inflammation in thousands of patients with excellent results. Adair and his associates at the Chicago Lying-In Hospital state "among the advantages of the Thermo-flo may be mentioned the extremely simple mechanism, the ease and rapidity of its operation and most important, the greater comfort afforded the patient." Falls, Bernell and Kobak in a recent paper from the Illinois Research and Educational Hospital and Cook County Hospital state "uniform distribution of heat over a large surface, negligible weight of an air-filled bag, relative freedom from potential burns and complete comfort during treatment are a few advantages of the Newman Thermo-flo apparatus."

Dr. Bengt Norman Bengtson (closing): Newman's discussion on the Newman device was inspiring. I should close with a few remarks on the subject of radiant energy as an effective thermotherapeutic agent. I feel I can regard the entire subject of pelvic heating objectively. I am not a detail man from an electric light company. Nor do I expect to receive any royalties should the device I am at present sponsoring prove worthy and be sold in numbers. Proceeds that might accrue will, by previous agreement, be turned over for the use of needy medical students at the University of Illinois. Thus, being a free agent, I can afford to regard the topic detachedly. And I expect when a better, more effective thermotherapeutic innovation for pelvic lesions is instituted to sponsor that in my small way and forget about radiant heat as an agent.

At the present time, however, I truly believe, after having given it a thorough and practical clinical trial, that radiant energy offers the best present method of deeply and effectively heating the tissues. Others too must entertain the same motion that short wave is superior to long wave energy for tissue heating, for witness the slow but inexorable extinction of the hot water bag and the rising sales of various types of infra-red apparatus.

(Continued on page 50)

MEDICAL NEWS

Status of Physical Therapy Technicians in the Army

A bill has passed the House and Senate to increase the pay and allowances of members of the Army Nurse Corps and to provide for the inclusion in the Medical Department of the Army of such female dietetic and physical therapy personnel as the Secretary of War may consider necessary. The bill was signed in Washington, D. C., on Christmas eve by the President.

As to the manner in which physical therapy technicians can get into the Army no further information is available as is seen from the following exchange of telegrams:

Chicago, Jan. 6, 1943.

To: Col. George Lull,
Personnel Division,
Surgeon General's Office,
Washington, D. C.

Will you inform me for publication night letter collect the manner in which physical therapy technicians who have completed regular course can get into the Army under new bill.

Reply:

Washington, D. C., Jan. 11, 1943.

No information available for publication pending approval of changes in army regulations.

(signed) MAGEE, Surgeon General.

Army-Navy "E" Flag Awarded H. G. Fischer & Co.

H. G. Fischer & Co., Chicago, on Dec. 4, 1942, became the first Illinois manufacturer of physical therapy and x-ray equipment to receive the Army-Navy "E" flag for outstanding production of war materials.

Rear Admiral K. C. Melhorn, M.C., U. S. Navy, presented the pennant, and H. G. Fischer, president, accepted it for the firm and its 200 officers and employees. The "E" flag was raised by a U. S. Navy color guard, and a Navy band took part in the ceremonies. Four boys from the Navy were presented as heroes who had been in battles of the present war.

Major General Frank Parker, executive director of the Illinois State Council of Defense, represented Governor Dwight H. Green of Illinois. Among the prominent citizens introduced by Lieutenant Commander W. N. Montgomery, U. S. Navy, the master of ceremonies, were Mayor Edward J. Kelly of Chicago, Dr. Bowman C. Crowell of the American College of Surgeons, Dr. W. P. Morrell of the American Hospital Association, Dr. John S. Coulter representing the American Medical Association and the American Congress of Physical Therapy and Dr. Frank H. Krusen of the American College of Physicians and the American Society of Physical Therapy Physicians.

Token presentations of the "E" pins to be worn by every member of the Fischer company were made by Lieutenant Colonel M. E. Griffin, M.C., U. S. Army. Walter E. Blessing, the employee longest in service, who has been with the firm since 1912, and Miss Florence Ballack, received the pins.

The Fischer Company is now engaged almost 100 per cent in war production. Only 1 per cent of firms engaged in the production of war materials have so far received the "E" award.

Lawyer Named Head of Cleveland Clinic Foundation

Edward C. Daoust, for more than twenty-five years a member of the firm of Garfield, Daoust, Baldwin & Vrooman, retired from the practice of law on January 1 to become the full time executive head of the Cleveland Clinic Foundation, which owns the Cleveland Clinic and its hospital. As foundation president Mr. Daoust will succeed Henry S. Sherman, president of the Society for Savings, who will become president of the board. A. C. Ernst will continue as vice-president and G. W. Gill and Remington Peck are secretary and treasurer, respectively. The clinic foundation is chartered as a nonprivate institution, operated for scientific, charitable and educational purposes. It employs 565 persons, including a staff of 69 physicians and surgeons. The principal properties are a 275 bed hospital and an eight story building that is devoted to experimental medicine and research. The cost of buildings and equipment exceeds $3,500,000 and the foundation's endowment funds for medical research and charitable service are close to $1,500,000. After the war the foundation plans to erect additional stories on the new Cleveland Clinic Building, which has foundations to support fourteen floors. The clinic was founded in 1921 by Drs. George W. Crile, William E. Lower and the late Drs. Frank E. Bunts and John Phillips.

Dr. Walter J. Zeiter, Executive Director of the American Congress of Physical Therapy is Director of the Department of Physical Therapy at the Clinic as well as Medical Director of the approved course for physical therapy technicians given at the Cleveland Clinic Foundation and Hospital.

Admiral McIntire Renominated Surgeon General

The President of the United States has renominated Rear Admiral Ross T. McIntire to be chief

(*Continued on page 41*)

ARCHIVES of PHYSICAL THERAPY

OFFICIAL PUBLICATION AMERICAN CONGRESS OF PHYSICAL THERAPY

.·. EDITORIALS .·.

LOOKING FORWARD

The threshold of the year 1943 finds the World in the midst of an unequalled global struggle. The end of 1941 brought the war to the United States, but it took another year to really bring it to every home, by dislocated family units and restrictions on food, heating, clothing and traveling. Most of the younger and many of the older medical men have joined the armed forces and the majority of those at home are doing double duty. We look forward to the coming months and years of war time conditions with a variety of emotions and resolutions.

As physical therapeutists we resolve to perfect further the scope and efficiency of our work so it may serve the largest possible number of those disabled by active warfare, in war work and by the accidents and diseases in everyday life. With the large scale training of medical men and technicians we look forward to an even larger increase in the general application of Physical Medicine as following World War I.

As physicians we resolve to do our share in protecting public health and safety under all circumstances and look forward to profound readjustment of our entire social structure with the hope that the individual practice of medicine with its many incentives for progress will not be submerged by regimentation.

As Americans we resolve to bear all sacrifices gladly when they serve to move us forward on the road toward final victory. Many of us have the feeling that as a prerequisite to a stable world peace we should also look forward as world citizens to a generally coordinated political and economic world structure which will safeguard life, liberty and the pursuit of happiness to all mankind and will effectively prevent the outbreak of another such gigantic holocaust as we are now experiencing.

INFLUENCE OF AIR IONIZATION

To the investigator interested in relating biological phenomena and the totality of the environmental effectors to which living organisms must adjust, few forces are as baffling as the vast electromagnetic disturbances, changes in air ionization and electrical potential, etc., which are constantly occurring in the environment of the organism. We have no receptors for electromagnetic forces, yet homing pigeons become confused when released in fields or forests in the vicinity of radio stations. With a fair degree of certainty, the human group becomes disturbed with periods of greater solar turbulence (as reflected in social upheavals, disease phenomena, change in the weight/length and sex ratio of the newborn, etc.). Are such changes direct effects of electromagnetic storms or indirect, through the medium of the air in which we exist?

Recently I received an 18-year record of a highly intelligent asthmatic patient, a record with accentuation of symptomatology with increasing frequency and magnitude of the Aurora Borealis. The patient had carefully considered other essential factors (infectious, allergic, seasonal, meteorological, etc.) and only solar turbulence with its electromagnetic disturbance remained as the outstanding factor.

Are some individuals more susceptible or sensitive in some fashion? Are certain disease phenomena the expression of such susceptibility? Köppen, one of Europe's great meteorologists, suggested that possibly 10 per cent of the population might be, in some fashion, unduly reactive.

It is understandable that Tchijevsky (Les Epidemies et les Perturbations Electromagnetiques du Milieu Exterieur), thoroughly familiar with this problem as it involved mass reaction to swings in solar activity, would turn to investigate the possible effect of changes in ionization of the aerosol on the human. He has published a brief review of some of his observations in this issue of the ARCHIVES.

It is unfortunate that the detailed protocols of his observations are not available; without them it is difficult to evaluate the validity of the conclusions that he has drawn. This is important not only because of the significance that must be attached to advance of our knowledge in this direction but also because contemporary work of American investigators such as Wait, Loeb, Herrington, and others has left the impression that change in ionization did not appear to be physiologically as effective as Tchijevsky's work might lead one to believe.

One of the difficulties arises from the fact that the organism, particularly the human organism, varies greatly from day to day and that the reaction of the individual to any such effectors as change in ionization must depend on the condition of the time, a factor that is only beginning to be appreciated by the physiologist. Under the circumstances, conflicting results are bound to obscure the picture. The other difficulty resides in the realization that animal observations are here not of great value—we must rely on the phenomena observed in the human subject and not only in the normal but in the sick individual.

With this in mind we must for the time accept the limitations involved in the approach to the field and hope that extension as well as intensification of such studies will permit definite conclusions, for it is possible that the field of therapeutic application may be a broad and useful one.

WILLIAM F. PETERSEN.

PHYSICAL MEDICINE ON THE INTERNATIONAL SCENE

There are unmistakable signs that the medical exigencies of the World War are accelerating the interest in efficient organization and expansion of physical therapy departments not only on the domestic scene, but the world over. In this issue of the ARCHIVES, Chavez[1] reports on a well conceived plan to secure physical therapy departments under competent medical direction and trained nurse-technicians, and with standard equipment for broadest possible use in all principal hospitals of the capital of Mexico. There is room for similar work in practically all of the Latin-American countries—although much good work is already being reported on from Argentina and Chile. Ways and means ought to be found to support such efforts from this country by unbiased educational advice and actual contact with leading medical men. Too much of the preceding "promotion" along physical therapy lines has been done by international manufacturing concerns interested more in selling quantities of high priced electrical apparatus than in clarifying the sound basic principles of physical medicine.

From Russia comes the article of Tchijevsky[2] on the controversial problem of artificial airionization. It emanates from a governmental experiment laboratory and adds to the accumulating mass of interesting research work in physical therapy produced in recent years by the various clinical and experimental state laboratories of Russia. In the United States the

Council of Physical Therapy of the American Medical Association has consistently promoted the carrying out of extensive research in physical therapy; but could only stimulate the work, for it could not provide laboratories, personnel or expensive equipment. There is no special institute and not even a large scale laboratory devoted to physical therapy investigation anywhere in the United States, as compared to the numerous institutes for drug research. The ambitious plan for a physical therapy institute on education and research outlined by Sanger[3] has evidently come to a standstill. Perhaps the animating effect of the experimental work carried on abroad may bring about the realization of such projects in this country.

From the British Isles came a few months ago a ringing plea by Smart[4] for an efficient organization by the medical profession to control physical therapy in order to prevent it from passing into unscrupulous hands. It is regrettable that while England has produced many brilliant clinicians and authors in physical medicine, its medical profession as a whole has taken comparatively little interest in this discipline. The cause of this condition seems to be twofold: First, the fact that the technicians there have taken the lead in organization and have firmly entrenched themselves as a craft which has carried on most of the practice of physical therapy; second, the organized medical profession in Great Britain has given the leaders in physical medicine much less support than have the enlightened leaders of medicine in this country, where, consequently, well balanced cooperation of physical therapy physicians and technicians has been established, which safeguards high standards to technicians and at the same time leaves room and incentive for physicians to take special interest in physical therapy. The formation of a society or institute of English speaking physicians as suggested by Smart should be an incentive in these critical times for international cooperation to carry forward the cause of physical therapy, in order to achieve the greatest possible benefit for the injured and the disabled both during war and in peace.

References

1. Chavez, Nicandro: The Importance of Physical Therapy in Mexico, Arch. Phys. Therapy **24**:17 (Jan.) 1943.
2. Tchijevsky, A. L.: Artificial Negative Aeroionization, Arch. Phys. Therapy **24**:20 (Jan.) 1943.
3. Sanger, William T.: Physical Therapy in Education and Research, Arch. Phys. Therapy **22**:581 (Oct.) 1941.
4. Smart, Morton: Physical Medicine: A Review and Policy, Brit. J. Phys. Med. **5**:60 (April) 1942.

THE EQUATION OF THE PATIENT

In the intelligent application of physical treatment energies it is not a question of what apparatus to apply to a certain diagnosis, but rather of what type of physical agent or combination of agents will best overcome the anatomic or functional disorder in the individual patient. Given every diagnostic analysis needed, there is still required judgment which breadth of experience in administration alone, can give to devise the appropriate measures and to estimate the strength, frequency and length of continuance.

Schmitt[1] in a practical manner discusses in the current issue the effects of temperature and atmospheric conditions on the treatment of ambulatory patients and emphasizes the influence of rest, posture and activity on the rate of improvement. In an earlier issue Petersen[2] stressed the fact that the

biochemical and physical status of patients differ from day to day and from season to season and therefore it is obvious that various physical agents must be used in a way that will take cognizance of the state of the individual and the weather.

Spa physicians such as Benczur[3] have found for many years that the so-called balneological reaction in patients varies in individuals. Lampert[4] considers every form of physical treatment as reactional therapy and divides his patients according to the type of reaction exhibited into two groups: The B type, which reacts quickly and strongly to physical treatment and the A type which reacts less markedly. The B type is characterized by the vegetative nervous constitution and shows much greater sensitivity to stimuli; it corresponds to the pyknic (compact) constitution from the standpoint of physique, while the A type is predominantly of the asthenic (elongated) build. These "vagotonic" and "sympathicotonic" different types of constitution should be considered not only when treating rheumatic disorders, but in all forms of treatment which act more or less on the body as a whole.

References

1. Schmitt, Milton G.: Some Practical Problems in the Management of the Physical Therapy Patient, Arch. Phys. Therapy **24**:14 (Jan.) 1943.

2. Petersen, William F.: Effect of Cold, Heat and Weather on the Human Being, Arch. Phys. Therapy **21**:522 (Sept.) 1941.

3. Benczur, Gyula: Nature and Duration of Thermal Cures and Thermal Bath Fatigue, Balneologe **6**:511 (Dec.) 1939.

4. Lampert, H.: Vegetative Nervous System and Physical Therapy, Med. Welt **11**:571 (Apr. 24) 1937.

PHYSICAL THERAPY

The importance that is attached to the department of physical therapy varies considerably among different types of hospitals. In every hospital, however, it should be considered an essential service. It has long been rated as one of the leading services in orthopedic hospitals. A 300 bed orthopedic dispensary and hospital in New York City, for example, reported the impressive total of 72,248 treatments during the year 1941. These included thermotherapy, underwater exercises, massage, active and passive corrective exercises, ultraviolet and galvanic feradic sinusoidal treatments. By way of comparison, a slightly larger general hospital in a nearby city reported 7,539 physical therapy treatments in 1941. This shows that the demand exists in all hospitals, although a wider range of treatments is needed in the orthopedic institution.

The Kenny method of treatment for acute poliomyelitis is making extra demands upon the department of physical therapy. The muscle reeducation should be administered by a physical therapy technician who has been specially trained in the method. It cannot well be undertaken by a nurse who has not had the physical therapy training.

As scientific procedure under the supervision of specially trained physicians, modern physical therapy originated during World War I. There is every indication that the second war will give it renewed impetus. The demand for trained technicians by the armed services is already large and will undoubtedly be increased as the need for rehabilitation grows. The only way in which hospitals can keep an adequate staff in this department is to train technicians when conditions are suitable. Standards for such training have been established by the American Physical Therapy Association. The status of the physical therapy technician is being improved through registration with the American Registry of Physical Therapy Technicians.

Organization, planning, records, procedure and conferences are as important in the operation of the physical therapy department as in any other scientific service. A Minimum Standard and description of the subject of physical therapy in general appear in the *Manual of Hospital Standardization.* — [Bull. Am. Coll. Surg. **27**:256 (Oct.) 1942.]

Medical News
(Continued from page 36)

of the Bureau of Medicine and Surgery of the U. S. Navy. Admiral McIntire graduated from the Willamette University Medical Department, Salem, Oregon, in 1912, and has been a member of the Navy Medical Corps since 1917. He was first appointed Surgeon General of the Navy in 1938. According to the *Army and Navy Journal*, Admiral McIntire declared a few days ago, in a radio address in answer to criticism and newspaper items concerning the large number of doctors being ordered to military service, "When the Marines go into battle, our people go with them, so when I hear statements made that perhaps we have too many doctors to care for our fighting men I want you to know that this is not so. We are only adequately furnishing medical personnel so that the lives of the wounded men, who may be your sons can be saved. I can assure you that there will be no waste of medical personnel."

Correspondence From Our British Colleagues

It gave me great pleasure to receive the Membership card of the American Congress for 1943. Though, I am sorry to say, circumstances are still against my travelling, I shall look forward to being able to visit the Congress before very long, though I doubt whether it will even be possible next year.

DR. JAMES MENNELL,
23, Park Square
Regent's Park, N.W.1.
December 4th, 1942.

Thank you very much for the membership card for the American Congress of Physical Therapy, 1943. Although I am unable to avail myself of the benefits this would give me if we were enjoying peace, the arrival of this card invariably gives me a great deal of pleasure as it reminds me of the pleasant and instructive time I had with the members of the Congress in 1939.

DR. P. BAUWENS,
21, Grosvenor Square,
W.1, London.
December 3rd, 1942.

Dr. Ivy to Direct Navy Research Institute

The new Naval Medical Research Institute at Bethesda, Md., was placed in commission on October 27. Among those attending the ceremonies were Rear Adm. Ross T. McIntire, surgeon general of the navy, and Rear Adm. Harold W. Smith, chief of the Division of Research. The institute will be concerned chiefly with the physical and mental conditions of aviators, submarine crewmen and marines. The scientific director of the new medical unit is Dr. A. C. Ivy, professor of physiology, Northwestern University Medical School, Chicago, who is now on leave of absence from the university; the officer in command is Capt. William L. Mann.

The 1943 Campaign Against Infantile Paralysis

Basil O'Connor's Letter to President Franklin D. Roosevelt

November 5, 1942.

The President,
The White House,
Washington, D. C.
My Dear Mr. President:

As you know, January 30, 1943, will mark the tenth public celebration of your birthday in the fight against infantile paralysis. In the same month The National Foundation for Infantile Paralysis, which you sponsored in 1938, will observe its fifth birthday.

During the past ten years, the public has given generously of its dollars and dimes for the fight against infantile paralysis. During the past five years —using those dollars and dimes—The National Foundation for Infantile Paralysis has led, directed and unified that fight, with the result that real progress has been made in the crusade against this crippling disease.

The work which the National Foundation has done in the fields of research and treatment of infantile paralysis is well known to you and is also well known to the public. For that work of research, which all of us realize is so vital, the National Foundation has enlisted the interest of the finest minds of the country and has supported them in their efforts to conquer this disease. In the field of the treatment of those who have been afflicted by infantile paralysis, the National Foundation has spared no money to care properly for those victims. Through its Chapters covering 2,900 counties, it has made relief immediately available to all who needed it—regardless of age, race, creed or color. In every epidemic the National Foundation has sent its own staff into the affected area and has given every assistance possible.

The demands on the National Foundation become greater each year and the amount which it spends for research constantly increases. In the fiscal year ended September 30, 1942, the National Foundation made grants and appropriations for the accomplishment of its work totaling $1,152,191.17, which, except for the year 1942, exceeds the amount which the National Foundation has received in any one year. This increased need for funds is due to the fact that the very existence of the National Foundation has stimulated additional research in important fields—fields that otherwise could not have been explored. Scientists now know that from the National Foundation they can receive continued support and not be compelled to give up their work at the very time when it begins to show promise.

In addition to its policy of making one-year grants, the National Foundation is now making some long time grants which calls for the earmarking of larger amounts of money over a period of time, but which fits into what the National Foundation considers a sound policy of fighting this disease.

There is no doubt in my mind or in the minds of the Trustees of the National Foundation that the fight against infantile paralysis should continue. We all believe that it would be a great mistake to permit a lapse in this great work which you have sponsored and which has been going on intensively for ten years. This too is a war and the advantages gained should not be sacrificed. It takes time and patience and money to bring into existence and put in proper working condition an organization for such a concerted attack. It can disintegrate, if permitted, far more quickly than it can be put together. In an undertaking such as that in which we are engaged, results are rarely, if ever, spontaneous or spectacular. They represent the accumulation of much work by many people over many years. Any gap in such a continuous fight may not soon be bridged—if bridged at all.

We are convinced, therefore, that there should be the usual fund-raising activity for The National Foundation for Infantile Paralysis in January, 1943, through the means of the celebration of your birthday. In expressing this conviction we are not unmindful of existing conditions. It is our belief that these very conditions furnish additional reasons for pursuing the fight against this disease relentlessly and uninterruptedly.

Although you have dedicated your birthday to the National Foundation for this purpose, nevertheless I feel that before officially announcing plans for the 1943 celebration of your birthday, I should obtain your views on this subject.

Faithfully yours,

BASIL O'CONNOR,
President.

President Roosevelt's Reply

November 10, 1942.

The White House,
Washington.

Dear Basil:

I have considered carefully your letter of November 5, 1942, requesting my views as to whether or not my birthday in January, 1943, should be publicly celebrated as heretofore in the fight against infantile paralysis.

In times such as these, that question cannot be decided entirely by itself. It must be judged in relation to other activities that we know are necessary to accomplish the one thing we all seek—Victory in this war.

At any time disease is a powerful enemy of man. In time of war, disease—particularly epidemic disease—is a factor which continuously gives us great concern. We know from history what can happen. We are constantly on the alert to prevent the start or spread of any of the epidemic diseases. There are no limits to which we will not go to accomplish that result. Such a policy is not only sound military strategy, but eminently humane.

And until it is definitely known how to prevent it from spreading, the threat of that disease—if it is epidemic—is one of our greatest dangers, even though the actual number of cases at any given time may be relatively small. As long as there are some cases the danger exists.

The intensive fight we have been carrying on against infantile paralysis over these ten years—a short time in the history of any disease—has shown remarkable results, as you say; but more than that, it has followed a course which indicates that we will succeed in this struggle. Through intelligent planning and wise coordination, we are prepared, if necessary, for a long time fight against this disease.

I feel as you do, that any interruption in this work would be extremely inadvisable unless absolutely necessary. More than that, I also think that such a fight as that being waged against infantile paralysis or any other as yet uncontrolled disease is an essential part of the main struggle in which we all are engaged—a struggle to make tomorrow's world a better world in which to live. While we fight this global war, we must see to it that the health of our children is preserved and protected so that they may enjoy that better world—for tomorrow's America will be as strong as today's children. We must help them win their Victory over disease today.

As I have said in the past and repeat now—nothing is closer to my heart than the health of our boys and girls and young men and young women. To me it is one of the front lines of our National Defense.

I feel strongly, therefore, that the work of the National Foundation must be continued and I am happy to have it use my birthday in its 1943 fund-raising drive.

With my best wishes for a successful Campaign, I am

Sincerely yours,

FRANKLIN D. ROOSEVELT.

Mr. Basil O'Connor,
President, The National Foundation
for Infantile Paralysis, Inc.,
120 Broadway,
New York City.

New Million Dollar Hospital

The dedication and formal opening of a new addition to the Hospital of St. Raphael, New Haven, took place October 24. According to the state medical journal, the structure, representing an expenditure of $2,000,000, is essentially a complete new hospital, for all patients will be cared for in the new building while the present structure will be left for service purposes. The new hospital is six stories high in the middle section with corresponding wings of four and five stories each on either end. On the first floor are the administrative, library and pediatric departments. On the upper floors are private rooms and wards of two to six beds, diet kitchens and utility and retiring rooms. The surgical division includes six operating rooms with the most recent type of air conditioning. The main kitchen, storerooms and utility rooms are housed in the basement, which also includes a coffee shop for the staff and visitors. In the main reception hall is hung a recent portrait of Dr. William F. Verdi, chief surgeon of the hospital, painted by Deane Keller, New Haven, and a gift of Mr. George Dudley Seymour, lawyer, New Haven.

California Basic Science Act Defeated

By a vote of 618,908 against to 385,444 in favor, the Basic Science Initiative, sponsored by the California Medical Association, was defeated at the election on November 3. Only four counties gave a favorable vote; of these San Francisco County gave the largest affirmative majority. Nearly $60,000 was expended by the California Medical Association in preparation of the act, securing signatures and in efforts to educate the voters to its desirability. The cultists and quacks, of which California seems to have more than its share, conducted a vicious "smear" campaign. Some of the advertisements consisted of personal attacks on Dr. Ray Lyman Wilbur, who for some reason was selected as the target for abuse, and might serve as examples for Goebbels in their lack of veracity and violence of language.

Dr. A. Bern Hirsh — Pioneer and Veteran

The current issue brings to a close Dr. A. Bern Hirsh's long and distinguished service as Managing Editor of the official *Journal of the Medical Society of the County of New York.*

Dr. Hirsh was a pioneer in this type of medical journalism. *The New York Medical Week,* for whose founding he was largely responsible, was one of the first and most successful publications of its kind in the country. After twenty years as its managing Editor, he continued in the same post with the new *Journal,* helping to guide it through the difficult period of reorganization.

Veterans of Dr. Hirsh's caliber do not "retire"; and the *Journal* hopes to continue to receive the benefit of his experience and advice. As he leaves active duty, "full of years and honor," he takes with him the affection and esteem of all who were privileged to know and work with him. — [Reprinted, J. M. S. County of New York **52**:4 (Dec. 26) 1942.]

Physician Elected to Congress

Dr. Walter H. Judd, Minneapolis, was recently elected representative from the Fifth Minnesota District to the Congress of the United States. Dr. Judd has been a missionary in China for many years and more recently has been stationed at Fenchow, Shansi. He graduated at the University of Nebraska College of Medicine, Omaha, in 1923. Dr. Judd was one of seven Americans who at a meeting of the American Bureau for Medical Aid to China on October 27 received a medal "of honored merit" for wartime services to China.

Course on Industrial Medicine

The New York Post-Graduate Medical School announces a course on industrial medicine, January 11-15, under the direction of Dr. Harry J. Johnson. The course will be conducted by physicians in industrial medical practice in cooperation with the faculty of the medical school. Additional information may be obtained by addressing the director of the New York Post-Graduate Medical School, 309 East 20th Street.

Meeting on Industrial Medicine and Surgery

The Central States Society of Industrial Medicine and Survery devoted its midwinter scientific session in Chicago, December 11, to war surgery and allied subjects. Among the speakers were:

Dr. William R. Cubbins, Compound Injuries.

Dr. Harold C. Voris, Head Injuries.

Dr. Italo F. Volini, Sulfon Drug Therapy.

Dr. James J. Callahan, Demonstration of Cases.

Dr. Raymond W. McNealy, Vascular Injuries in Reference to War.

Dr. George L. Apfelbach, Contaminated Wounds with Gas and Tetanus.

Dr. Milton H. Kronenberg, The Problem of Nutrition in Industry.

Harold A. Hooper, D.D.S., Mouth to Mouth Absenteeism.

Dr. Hedwig S. Kuhn, Hammond, Ind., Visual Testing in Industry.

Major William J. McConnell, War Department, Hygiene Supervision of Ordnance Plants.

The dinner session was addressed by Colonel Norman T. Kirk, M.C., U. S. Army, on "War Surgery."

Army-Navy E Awarded to Winthrop Chemical Company

About a thousand employees and distinguished guests attended ceremonies at the plant in Rensselaer, N. Y., and at the offices in New York of the Winthrop Chemical Company, at which the Army-Navy E was presented to the Winthrop Chemical Company, which is manufacturing many vital drugs for the armed forces, among which is atabrine, synthetic substitute for quinine in the treatment of malaria. Atabrine is being manufactured in the United States today, said Dr. Theodore G. Klumpp, president of the company, at a rate of nearly one billion tablets a year. The flag was accepted for Winthrop's plant at Rensselaer by the plant superintendent, Dr. A. E. Sherndal. Dr. Klumpp in New York accepted the flag on behalf of the management. The principal speakers at the ceremonies were Brig. Gen. Charles C. Hillman of the Surgeon General's Office, Washington, D. C.; Rear Admiral Charles S. Stephenson of the Bureau of Medicine and Surgery, U. S. Navy; Dr. Morris Fishbein, and Lowell Thomas.

The Pandiculator-Medical Fraud

This department of *The Journal,* April 4, 1942, page 1240, contained an article which reported in detail the fraud order which the Post Office Department had issued on Dec. 8, 1941 against the Pandiculator Company of Cleveland, a concern that for over thirty years had been perpetrating on the public a swindle in the form of an alleged spine stretching, height increasing mechanism called "The Pandiculator." The article showed that, according to the evidence brought out at the hearing of this case the business was wholly owned by a Cleveland attorney, one Henry C. Crowell, designated as "secretary," whose name was included in the fraud order, and the discussion concluded with the comment "Thus passes—it is hoped—a scheme that has swindled the credulous for many years." Hardly was the ink dry,

however, when it was learned that already (April 3) the Post Office had found it necessary to issue an additional fraud order, this one against Crowell himself. Soon after the original one was issued the Post Office discovered that the swindle was being continued by Crowell under his personal name and that in one circular letter which he was putting out, and which was identical in form and content with one used before the first fraud order was issued, Crowell had added the postscript "Address *me* at 11432 Mayfield Rd." The circular letter was dated Feb. 26, 1942. The Post Office inspector whose investigation of the activities of the Pandiculator Company had resulted in the fraud order against it now instituted a test correspondence with H. C. Crowell. He wrote Crowell, in effect, that he had procured one of the circulars of the Pandiculator concern about a year previously but that recently, after sending in an order for the device, his letter had been returned, "marked fraud or something," and that he had been advised that a letter to H. C. Crowell probably would receive a reply. It did—on the letterhead of Henry C. Crowell, who wrote: "Glad to hear from you. Who gave you my address? Yes, if you will mail me personally, $25, I will see you get a Family Model. Better make it prompt." Since the evidence gathered by the Post Office clearly indicated that Crowell was seeking to evade the terms of the original fraud order against the Pandiculator Company by soliciting remittances for the device by means of the circular letter containing representations substantially similar to the earlier claims, a new fraud order was issued on April 3, 1942 against the names H. C. Crowell and Henry C. Crowell.—[J. A. M. A. **120**:1244 (Dec. 12) 1942.]

"Opportunity"

Recently the National Society for Crippled Children of the U. S. A., Inc., Elyria, Ohio put out a free booklet "Opportunity" which is a short story of the development of a program for crippled children in America during the last two decades.

This booklet shows that absorption of orthopedic surgeons by the armed forces has greatly depleted services available for the civil population. The emergency has created a shortage of trained physical therapy technicians in this and allied fields—a shortage which every effort is being made to alleviate. The booklet gives a number of interesting charts and much valuable information on the activities of the Society.

Protection for Industrial Plants

The Office of Civilian Defense, Washington, D. C., has published a pamphlet entitled "Passive Protection for Industrial Plants" in which, in the section on "Medical Services," it is recommended that each industrial plant, in addition to providing its own medical staff and first aid equipment, should plan in collaboration with the chief of the Emergency Medical Services of the locality for (1) services of ambulances and Emergency Medical Field Units when needed, (2) available beds at one or more hospitals to which the severe casualties may be transported, (3) the establishment of a casualty station of the Emergency Medical Service within a short distance of the plant and (4) obtaining the services of Emergency Medical Field Units if needed to supplement the plant medical service during an emergency.

If the industrial plant is miles from the hospital, the casualty station should be larger than the average and must be equipped at least with the emergency medical supplies in medical division bulletin No. 2, equipments lists 1 and 2. The primary purpose of the casualty station is to care for the slightly injured and thus protect the hospitals from caring for minor casualties; it will serve also as a center for the storage of medical supplies and for the dispatch of medical service to different parts of the plant. The first aid posts are established at the time of emergency as near as possible to where the casualties are being extricated.

All general hospitals in the community are included in the Emergency Medical Service, and the community control center will designate the hospital to which casualties from the industrial plant may be sent. Trained stretcher bearer teams should be organized among the employees by the medical director, each team comprising four persons. Five per cent of the plant personnel should be trained in these duties in order to have stretcher teams on call during each shift and in each wing of the plant. The minimum number of stretchers recommended, according to this pamphlet, is in plants having from one to ninety-nine employees—one stretcher for each twenty-five persons, and in plants having from one hundred to four hundred and ninety-nine employees, one stretcher for each fifty persons (minimum of four).

It will be advisable for industrial plants to provide improvised ambulances for their use in the event of an emergency. All requests for ambulance service from the community should be made to the control center of the Citizens' Defense Corps.

Concentrated Program for Patients with General Paralysis

The state department of public health and the state department of public welfare have made arrangements whereby patients in danger of developing the symptoms of general paralysis will be given a two to three weeks' course of fever therapy in the state mental hospitals, according to the *Welfare Bulletin*. The nine state mental hospitals located at Chicago, Elgin, Manteno, Kankakee, Peoria, Jacksonville, Alton, Anna and East Moline have set aside sufficient beds and personnel so that these patients can be given a minimum of twelve "fevers" of several hours' duration, with a temperature of 103 F. or higher. The treatment takes two to three weeks, depending on the rapidity with which enough high "fevers" are secured. As far as possible, the nonpsychotic patients entering the state hospitals for this purpose will be segregated from regularly committed psychotic patients. The patients will be received by the nine mental hospitals without voluntary or involuntary commitment papers provided they have been properly certified as being appropriate patients for this type of treatment by the designated health officer of the state department of health. Physicians

and clinics wishing to refer patients to the state hospitals for fever therapy to prevent general paralysis should get in touch with any of the following, not with the state hospital but with the health officer of the designated area:

Chicago State Hospital (Dunning) Dr. Edward A. Piszczek, health officer of Cook County.
Elgin State Hospital, Dr. Felix A. Tornabene, Chicago.
East Moline State Hospital, Dr. Cornelius E. Kline, Moline.
Peoria State Hospital, Dr. Sandor Horwitz, East Peoria.
Manteno State Hospital, Dr. Abraham J. Levy, Gilman.
Kankakee State Hospital, Dr. Levy.
Jacksonville State Hospital, Dr. Frank E. McCord.
Alton State Hospital, Dr. Norman J. Rose, Highland.
Anna State Hospital, Dr. Roy W. Harrell, Carbondale.

The *Welfare Bulletin* points out that this fever therapy program should prove a valuable addition to the welfare department's program of preventing the unnecessary long time custodial care of patients in institutions through the execution of active preventive and therapeutic procedures.

Stipulations—Agreements Between Federal Trade Commission and Promoters of Various Products.

The following items are abstracts of stipulations in which promoters of "patent medicines," medical devices and cosmetics have cooperated with the Federal Trade Commission to the extent of agreeing to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Sulfo-Bath. — That this gives relief from nervousness, colds, insomnia, eczema, hives or poison ivy, is "health-giving," provides radiant health, imparts energy, or has any effect on rheumatism, neuritis, sciatica, arthritis or lumbago, except to relieve their accompanying pains, were misrepresentations to be discontinued in the advertising, according to a stipulation which B. G. Pratt Company, New York, signed with the Federal Trade Commission in October, 1942. This concern further agreed to cease representing that "Sulfo-Bath," by causing the skin to absorb sulfur, would give one a healthy or beautiful complexion or correct the conditions which cause dandruff, itching scalp, falling hair, skin troubles and severe cases of athlete's foot.

Sun-Ra Vitamin Ointment. — In a stipulation signed in July, 1942, with the Federal Trade Commission by a John A. Muise and an Arthur S. Ryan, doing business as Sun-Ra Company, Gloucester, Mass., these persons agreed to cease representing that their product is a remedy, treatment or cure for eczema or is of any value in treating psoriasis, insect bites, abrasions or skin irritations beyond having a limited value in the treatment of bites of nonvenomous insects and in the relief of minor abrasions and skin irritations; that the preparation is healing or contains boric acid or has no harmful ingredients. Muise and Ryan further agreed to cease using the word "Vitamin" as part of the brand name for their product or otherwise representing that it has any merit by reason of any vitamins that it may contain.

The Kenny Treatment in Infantile Paralysis

To the Editor:—Dr. McCarroll in *The Journal,* October 17, states that he feels sure the Kenny method of treatment for the disease infantile paralysis would in time takes its place among the others offered by the field of physical therapy as having been tried but found wanting.

The application of physical therapy in the past was for symptoms that did not exist and, consequently, the results could not have been satisfactory. I am not referring to the pathology of the disease but to the symptomatology.

The symptomatology accepted by Dr. McCarroll, for which physical therapy has had no response — in fact, according to his investigation, has proved damaging — is that previously accepted throughout the world. It may be explained by an extract from Public Health Bulletin No. 242, presented to me by the National Foundation for Infantile Paralysis on my arrival in the United States of America:

> The damaged nerve cells are in the cord inaccessible to any form of treatment, their recovery being based on the character and degree of injury they have sustained. At this point appears the importance of the muscle, a tissue in no way directly attacked by the virus but rendered as useless by its loss of innervation as an automobile with its battery stolen. The muscle undergoes certain degenerative changes, the most important of which is its loss of tone or state of tension, so that instead of being taut and elastic it is relaxed, easily stretched and sagging like a hammock between its point of origin and insertion.

The result of treatment by physical therapy as it is practiced throughout the world is presented by Dr. McCarroll in (1) the *Journal of Bone and Joint Surgery,* October 1941, and (2) *The Journal of the American Medical Association,* October 17, and reads:

	Percentage of Normal Recoveries
Group 1. Immobilization 1 to 4 months. No physical therapy	9
Group 2. Immobilization 1 to 3 months. Physical therapy 3 to 6 months	0
Group 3. Immobilization 4 to 18 months. No physical therapy	2
Group 4. Immobilization 3 to 12 months. Physical therapy 8 to 24 months	13
Group 5. No treatment	17

It will be seen by this statement that physical therapy, as it is practiced, not only failed to achieve results but prevented recovery in a certain percentage of cases.

The Kenny concept of the symptomatology (which is just the opposite to that already quoted) first appeared in *The Journal,* June 7, 1941. This concept appeared in the report of my work presented by Dr.

Wallace Cole, professor of orthopedic surgery, and Dr. Miland Knapp, professor of physical therapy, University of Minnesota Medical School, and reads:

> Miss Kenny has presented ideas which are new to us in the symptomatology and treatment of infantile paralysis. . . . According to this concept the cardinal symptoms of infantile paralysis are, to use her terms, muscle spasm, muscle incoordination and mental alienation. This is opposed to the usual concept where the cardinal symptom is flaccid paralysis without spasm or incoordination. The presence of spasm has been demonstrated in 100 per cent of the acute cases observed in this study.

The results of the treatment given for this concept also appeared in (1) the report mentioned and states that there were 55 per cent recoveries to normal in 32.6 days, and (2) the records of the Orthopedic Hospital, New York, presented to the medical observers of the work at the University of Minnesota and myself by Dr. Robert Bingham in June 1942, and reads:

I. "Orthodox Treatment"—absolute bed rest with immobilization by means of splints or plaster casts and shells for protection of weak and paralyzed muscles, prevention of and correction of deformities, and physical therapy and muscle training.

II. "Orthodox plus Kenny Treatment"—substitution of the Kenny methods on patients who had received the classical treatment at onset of their illness for some period of time.

III. "Kenny Treatment"—for symptoms in the acute stage: bed rest and hot moist formentations for muscle spasm, passive motion to restore awareness in mental alienation, and muscle reeducation for muscle incoordination and recovery of muscle power.

The average duration of hospitalization in the three groups:

Group I.	16 months
Group II.	9 months
Group III.	6 months

Estimated results of treatment:

	"Orthodox Treatment" 12 Patients	"Orthodox Plus Kenny" 24 Patients	"Kenny Treatment" 24 Patients
Patients with residual paralysis (muscle groups fair or less)	10 87%	14 58%	8 33%
Number of braces needed (some patients use several)	19 braces	10 braces	6 braces
Patients needing braces or surgery	6 50%	8 33%(?)	4 16%(?)
Patients with deformities	9 75%	6 25%(?)	2 8%(?)
Functional result:			
Excellent	1	6	11
Good	3	8	10
Fair	4	7	3
Poor	4	3	0

The results obtained by physical therapy taught at the University of Minnesota and the City Hospital, Minneapolis, for the true symptoms of this disease speak for themselves and need no comment from me.

The evidence presented in this communication is not my own but supplied by physicians. The slides presented by Dr. McCarroll throughout the state of Missouri and elsewhere, presented certain patients treated at the Gillette State Hospital, were not patients who had received the Kenny treatment.—ELIZABETH KENNY, Minneapolis.

—[J. A. M. A. **120**:1335 (Dec. 19) 1942.]

"The Role of Physical Therapy in the Early Treatment of Poliomyelitis."

To the Editor.—In the article of Dr. H. R. McCarroll entitled "The Role of Physical Therapy in the Early Treatment of Poliomyelitis" (*The Journal*, October 17, p. 517) statistics are cited purporting to show that no treatment is better than any treatment in the care of this disease. When he attempts to include the Kenny work in his generalizations Dr. McCarroll is drawing conclusions which are not based on facts known to him. Dr. McCarroll admits that "in this study there have been no cases treated by the Sister Kenny method."

Mr. McCarroll says "It has been my privilege to visit briefly the various hospitals in Minneapolis and see some of the cases treated under Sister Kenny's supervision." The actual personal acquaintance of Dr. McCarroll with Sister Kenny extended over a period of approximately two hours. During this brief time it would obviously have been impossible even for Miss Kenny to demonstrate, much less prove, her contention that the true symptoms of the disease of poliomyelitis had not been recognized previous to her work. As a matter of fact, Dr. McCarroll has completely missed this main point of his visit. Miss Kenny's discovery is definitely not that there is a cure or even a treatment for the paralysis of polioymelitis but rather that there are muscle conditions which are far more damaging to the bodily mechanics if unrecognized and untreated than is paralysis. Dr. McCarroll could not possibly have found a satisfactory treatment for the disease of poliomyelitis if he has neglected to acquaint himself with the true symptoms of the disease.

Miss Kenny has decisively proved her point to those who have taken the time during the past two and one-half years to observe her work. Miss Kenny has brought to us the only physical therapy which could have been effective in treating the disease of poliomyelitis, since it is based on the symptoms which she alone discovered. Miss Kenny would be the first to deny that she claims any cure for paralysis. The patients in her hands and those of her trained assistants do, however, have remarkably little disability following treatment in spite of paralysis. — JOHN H. POHL, M.D., Minneapolis.

—[J. A. M. A. **120**:1157 (Dec. 5) 1942.]

Physicist Named Head of Parmly Foundation

Peter J. Mills, M.S., head of the department of physics and of mathematics at Thornton Junior College, Harvey, Ill., has been appointed director of the Parmly Foundation for Auditory Research. Mr. Mills graduated at the University of Chicago. An advisory committee has been appointed comprising the following: Dr. John S. Coulter, associate professor and in charge of the department of physical therapy, Northwestern University Medical School; Howard Carter, B.S. in M.E., secretary of the Council on Physical Therapy, American Medical Association; Haldon A. Leedy, Ph.D., and Donald E. Richardson, M.S., physicist, Armour Research Foundation; Jesse E. Hobson, Ph.D., director, and Paul G. Andres, E.E., professor, of the Illinois Institute of Technology electrical engineering department; James S. Thompson, Ph.D., director, and Paul L. Copeland, Ph.D., professor, department of physics at the institute of technology. Dr. Mills will serve as chairman of the advisory committee. The founda-

tion, which was just established this fall, will seek to solve problems of hearing through research. Regarding hearing difficulties as a biophysics problem, the Parmly Foundation will concentrate its work on the physics of hearing. Additional appointments to the advisory committee, particularly from the medical field, will be made by the foundation so that cooperation with the medical profession in regard to other aspects of the field may be obtained. The Parmly Foundation is located in the physics building on the south campus of the Illinois Institute of Technology, 3323 Federal Street.

Occupational Therapy

The excellent "Salem Issue" of *The Modern Hospital*, February, 1942, gives a vivid and comprehensive description of all departments of a typical hospital. Because of its newness, the department of occupational therapy at Salem Hospital, as described in that issue, is particularly interesting. The department was established in 1937 to answer a definitely felt need, and it is apparently more than fulfilling expectations as an aid to recovery of the patient. According to this description, the occupational therapy department has three main functions: (1) to teach the value of proper mental and physical occupations for the sick; (2) to encourage and supervise diversional activities among the patients; (3) to administer prescribed occupational treatments the purpose of which may be to increase function of joints or muscles, to stimulate circulation, or to assist the patient in making a difficult adjustment. It is stated that the majority of patients, both those referred for treatment and those who do not require special attention, need some type of diversion. The service is available to all patients of the hospital upon the prescription of a physician. Children and adults, out-patients and inpatients are all accepted. No charge is made, and the cost is comparatively negligible because of the generous amount of volunteer service that has been given. Red Cross Gray Ladies, especially trained for library service, visit all patients with the book chart three times a week. They also visit or read to patients upon request, promote monthly parties, and direct rhythm band activities in the children's ward.

Voluntary assistance for this kind of work is readily available in almost any community at the present time, but the department must be directed by a trained therapist and treatment should always be under the supervision of the attending physician.—[Bull. Am. Coll. Surg. **27**:257 (Oct.) 1942.]

Dr. Pettitt Named Chief of the Emergency Services

Dr. Herbert L. Pettitt, Morrison, who recently resigned as assistant state health director to resume private practice, has been appointed chief of emergency medical services in the Illinois Defense Council. The position was formerly held by Dr. Roland R. Cross, Springfield, state health director. Dr. Pettitt will devote only part time to the position.

New Rehabilitation Center for Women With Venereal Diseases

The state department of health has approved plans to use the former home of Mr. and Mrs. Charles A. Lindbergh, Hopewell, as a hospital and rehabilitation center for women infected with venereal diseases. The state acceptd the Lindbergh home as a gift more than a year ago.

The Kenny Technic

Dr. Philip M. Stimson, New York, delivered a lecture, January 5, on "The Early Treatment of Poliomyelitis with a Description and Evaluation of the Kenny Technics." The meeting was a joint session of the Onondaga County Medical Society and the Syracuse Academy of Medicine, under the auspices of the state medical society and the state department of health. On December 15 the Albany County Chapter of the National Foundation for Infantile Paralysis sponsored a free demonstration of the Kenny method. Dr. Don W. Gudakunst, medical director of the National Foundation, New York, was the principal speaker.

Medal Awarded to Sister Kenny

Sister Elizabeth Kenny, who has established her headquarters in Minneapolis, was presented with the annual medal of *Parents' Magazine*, awarded for outstanding service to children.

Dr. Hinsdale Leaves Greenbrier

Dr. Guy Hinsdale, who for thirteen years served as medical director of the Greenbrier Hotel and Cottages, White Sulphur Springs, has moved to Lewisburg. The former "spa" has been taken over by the government to be converted into an army hospital.

BOOK REVIEWS

SERVICES TO THE ORTHOPEDICALLY HANDICAPPED. *Louise P. Hoyer,* Director of Study, and *Charles K. Hay,* Assistant Director of Study. Boards. Pp. 115, illustrated. Price, $0.50. Philadelphia: Superintendent of Schools, 1942.

This is a report of a study made under the auspices of the Trustees of the Widener Memorial School for Crippled Children and the Board of Public Education School District of Philadelphia. In the book is found a complete program to coordinate orthopedic, physical and occupational therapy in schools for crippled children. The study indicates that physical therapy is on a well established basis in practically all the schools visited. It emphasized the coordination of physical therapy with the educational program. Occupational therapy as represented by the presence of a qualified occupational therapist is not found in many schools, but as stated by the authors "there was ample evidence of interest in it and considerable likelihood that occupational therapists would be found in orthopedic schools generally in the near future. They were found in all the curative workshops and hospitals visited." This monograph is highly recommended to all physicians, school directors and technicians interested in physical therapy.

THE PATIENT AS A PERSON. A STUDY OF THE SOCIAL ASPECTS OF ILLNESS. By *G. Canby Robinson,* M.D., LL.D., Sc.D., Lecturer in Medicine, Johns Hopkins University. Cloth. Price, $3.00. Pp. 423. New York: The Commonwealth Fund, 1941.

This study was undertaken because it was recognized that the procedures for discovering and controlling social influences detrimental to the sick are not so well developed as are other methods of medicine, and more reliable procedures need to be devised. Robinson shows that the human problems which surround the patient form an important component of illness and that it is the doctor's duty to understand them. The study is divided into nine chapters: the elements of illness and their relation to medical service; the methods and scope of the study; patients with circulatory symptoms; patients with respiratory symptoms; patients with digestive symptoms; the diabetic, the syphilitic and the epileptic; the psychoneurotic patient; patients with various conditions, and the treatment of the patient as a whole.

Robinson found from a study of 174 unselected patients with the above mentioned diseases who had been admitted to the Johns Hopkins Hospital from a typical urban community that definite adverse social conditions were found in the lives of 80 per cent of the patients and in 66 per cent, there was a definite relation to their illness. These adverse social conditions caused harmful emotional reactions in 58 per cent of the patients. In 26 per cent adverse social conditions produced emotional reactions that were considered to be the chief cause of illness, while an additional 10 per cent of the total group had emotional disturbances that were the cause of their illness, though no definite relation to adverse social conditions could be established.

The physical therapy physician is in a favorable position to study the human organism in its entirety, both as a living mechanism and as an essential element of human society. In the hospital ward or room the physician attending the patient has little time available for the serious consideration of the individual and of the personal problems that are contributory to his illness. The patient treated in the physical therapy department spends at least an hour daily in this department. The physician in charge and his physical therapy technician have time to discover and help to control the social influences detrimental to the sick and the injured. This book is highly recommended to every physical therapy physician.

CLINICAL ANESTHESIA. By *John S. Lundy,* B.A., M.D., Head of Section of Anesthesia, Mayo Clinic, Rochester, Minn.; Professor of Anesthesia, Mayo Foundation for Medical Education and Research. Graduate School, University of Minnesota; Diplomat and Member of the American Board of Anesthesiology, Inc.; Member of the Subcommittee on Anesthesia, National Research Council. Cloth. Pp. 771, with 266 illustrations. Price, $9.00. Philadelphia & London: W. B. Saunders Company, 1942.

The field of anesthesia has expanded tremendously in the past fifteen years, particularly in methods of anesthesia by local methods. Dr. Lundy's vast experience in this work has provided him with the material to present this most comprehensive and detailed study of anesthesia in all its various phases. Dr. Lundy has so thoroughly covered the subject that this book could properly be termed "an encyclopedia of anesthesia." The illustrations are clear and easy to understand and the text is written in an interesting style that holds the attention of the readers.

The chapter on "The Choice of Anesthetic Agents" is timely and will solve many problems for the average physician. Of great interest are the chapters on preoperative and postoperative care of general anesthesia patients. Probably the most interesting portion of the book is the chapter on regional and field block anesthesia by the use of local agents. The various technics of administering these local agents and the surgical anatomy and approach are explained in complete detail but with great simplicity. The chapter on intravenous anesthesia, its uses, indications and contraindications is especially good. Most of the drugs previously used for this purpose have been

discarded for evipal soluble and pentothal sodium. This is not a book written primarily for the anesthetist. It should be read and owned by every physician who does surgery of any kind. It is the most complete and interesting work on anesthesia to be published to date.

PROBLEMS OF AGING: BIOLOGICAL AND MEDICAL ASPECTS. Edited by *E. V. Cowdry,* Washington University, St. Louis. A Publication of the Josiah Macy, Jr., Foundation. Second Edition. Cloth. Price, $10.00. Pp. 936, with 129 illustrations. Baltimore: Williams & Wilkins Company, 1942.

The eminent philosopher, John Dewey, stated in the introduction: "The problem, both scientifically and philosophically, it seems to me, is that of the relation of aging and maturing. We are at present more or less in the unpleasant and illogical condition of extolling maturity and deprecating age. It seems obvious without argument that there is some connection between the two; that we cannot separate the processes of maturing from those of aging even though the two processes are not identical. The split that now exists between the two, in terms of both individual activity and happiness and of social usefulness, would appear to be socially or culturally produced, rather than to be biologically intrinsic." He stated that there is something abnormal in the situation if we are obliged to admit that after a certain period nothing better in any direction, individual or social, can occur because of the process of growing old. This book should be read by every physician.

This volume is a timely and logical development of the problems of aging. The editor and the thirty-seven contributors are authorities in their field, and furnish the opportunity to bring to bear on the problem the experience and points of view of many specialists, working together in a constructive way. The editor calls our attention to the fact that as the data from the 1940 census have become available we see more clearly the importance of the problem of aging. One of these is the mobilization of an increasingly large percentage of older people in the war effort, and also for the post war reconstruction. It is interesting to note that the percentage of those sixty-five years and over, calculated in advance for 1940, was surpassed.

Since the publication of the first edition in 1939 three definite steps have been taken to organize research on aging. Encouraged by the Josiah Macy, Jr., Foundation and with the aid of Dr. E. J. Stieglitz, Surgeon General Parran has appointed a National Advisory Committee on Gerontology and authorized a nationwide survey of investigations on aging by the U. S. Public Health Service. This fact finding and coordinating function has been supplemented by reorganization of the National Research Council's Committee on Aging under the chairmanship of Dr. A. J. Carlson, as a fund raising agency and planning group concerned with research formulations and action has been established under the American Branch of the International Club for Research on Aging. Nine new chapters have been included in this edition without greatly increasing the size of the volume. Consequently in revising and bringing up to date the chapters in the first edition considerable abbreviation has been necessary. This book is concerned mainly with the fundamental problems of aging and the care of the aged population. In view of the trend toward an increasing proportion of older men and women in our society it is no longer a question of finding ways and means of prolonging life but more important of learning how to conserve the health, vitality and functional efficacy of individuals so that they will not be subject as they grow older to the many handicaps and impairments that so often cloud or burden the later years of life. As Dr. George Morris Piersol of the Council on Physical Therapy of the American Medical Association has aptly remarked, our concern today is to "add more life to the years rather than more years to life."

MENTAL ILLNESS: A GUIDE FOR THE FAMILY. By *Edith M. Stern,* with the Collaboration of *Samuel W. Hamilton,* M.D. Cloth. Pp. 152. Price $1.00. New York: The Commonwealth Fund, 1942.

As the result of careful study Mrs. Stern has prepared this little volume to be used by the families that are concerned about the patient with a mental illness. Dr. Samuel W. Hamilton, Mental Hospital Advisor of the United States Public Health Service has collaborated with Mrs. Stern and the result of their efforts is a book that is both authoritative and readable. There are 18 short chapters which guide the lay person through the steps of all the problems that arise when a mental illness is first or later noticed. To further assist the family in the appendix section is found among other items of information the methods of admission to mental hospitals, national and state mental hygiene societies and committees and some terms that may be heard used in connection with the patient or the hospital. It can be recommended because it gives the practical information and guidance that the family needs to have.

MANUAL OF WAR-TIME HYGIENE. Supplement to A College Textbook of Hygiene. By *Dean Franklin Smiley,* A.B., M.D., Professor of Hygiene and Preventive Medicine in Cornell University; Lieutenant-Commander, United States Naval Reserve; and *Adrian Gordon Gould,* Ph.B., M.D., Attending Physician and Assistant Professor of Hygiene and Preventive Medicine in Cornell University; Lieutenant-Colonel Medical Corps, United States Army. Paper. Pp. 86. Illustrated. Price, $1.00. New York: The Macmillan Company, 1942.

Personal hygiene will have increased importance during these war times for the good of the student himself, but from the point of view of a student fitting himself for assuming on graduation the responsibility for the health and well-being of groups of men in the Armed Forces the subject becomes one of practical, vocational interest as well as one of personal interest. Community hygiene must, in

these war times, deal largely with problems of field sanitation, and military organization for combating infectious disease, wounds and gassing, and forego discussion of many of the community problems of peace time. According to the authors this is the purpose of the present pamphlet. It is to provide a brief summary and bibliography of those materials which a college student should add to his regular college hygiene course in order that he may be equipped to meet his health responsibilities as an officer in the Armed Forces or in Civilian Defense in the years immediately following his graduation. The work is divided into three chapters, military hygiene, civilian defense and war-time first aid. There is an appendix and bibliography. The book can be highly recommended to those in need of this supplement.

PSYCHOLOGY IN NURSING PRACTICE. By *Philip Lawrence Harriman,* Ph.D., Professor of Psychology, Bucknell University, Lewisburg, Pa.; *Lela L. Greenwood,* B.A., R.N., Teaching Supervisor of Medical Pavilion, Bellevue Hospital, New York City; Assistant Instructor, Department of Therapeutics, New York University Medical College and *Charles E. Skinner,* Ph.D., Professor of Education, New York University. Cloth. Pp. 483. Price $3.25. New York: The Macmillan Company, 1942.

While the book has been prepared primarily for the student nurse yet the subject matter is broad enough to be used by any students entering the medical profession. We have in mind the physical therapy technician who is required to study the subject of psychology, but to date in a limited sense. As stated by the authors in their preface the book should guide the student in making harmonious adjustments to her associates, in achieving prompt and satisfactory personal insights and in applying the principles of psychology in her professional experience. To facilitate the teaching of the volume, center and side headings have been used to show the organization of the material, provocative questions and selected references have been appended to each chapter, and a list of supplementary references in the field of psychology is presented in the Appendix. The book as a whole seems to be especially practical and can be recommended to all those teaching or studying physical therapy.

MANUAL OF OXYGEN THERAPY TECHNIQUES INCLUDING CARBON DIOXIDE, HELIUM AND WATER VAPOR. By *Albert H. Andrews,* Jr., M.C., Director, Oxygen Therapy Department and Assistant Attending Otolaryngologist, St. Luke's Hospital, Chicago; Instructor in Laryngology, Rhinology and Otology (Broncho-esophagology), University of Illinois College of Medicine; Associate Attending Broncho-esophagologist, Children's Memorial Hospital, Chicago; Former Research Instructor Department of Physiology and Pharmacology, Northwestern University Medical School. Cloth. Price, $1.75. Pp. 191 with illustrations. Chicago: The Year Book Publishers, Inc., 1943.

According to the author this book is intended more as a technical handbook than a medical textbook. Correct administration of oxygen therapy requires attention to many details which are overlooked so frequently that a manual of this type has been considered necessary. New procedures now under investigation have been purposely omitted. Special instructions which are required for specific makes of equipment have been based on the assumption that the reader is acquainted with the particular make. The technic of resuscitation has been omitted. The equipment for the administration of the gases covered in this presentation is described and the care of such equipment is discussed. Water vapor, usually not considered a therapeutic gas, has been included because the value of humidification is recognized more and more in the prophylaxis and treatment of certain diseases. The author has attempted to make the material in this manual suitable for application in the hospital, the home or wherever the beneficial effects of gas therapy are needed. The book is considered timely and a valuable aid in the administration of oxygen therapy.

Sustained Internal Radiant Heat in Lesions of the Pelvis — Bengtson

(Continued from page 35)

A second definite advantage of radiant forms of heating in the treatment of female pelvic lesions over present conduction forms is the length of treatment without danger and certainly without discomfort. A single treatment under controlled conditions could be maintained almost indefinitely. Dr. McGuiness thought I was fortunate in having patients who would remain under therapy for ten hours. I have on occasion had the unit inserted at bedtime and had the patient go to bed, to awaken in comfort in the morning with the unit still in operation. Most of the patients on daytime treatments slept for two, three, four or five hours per treatment; others read, knitted or wrote letters or in some other fashion whiled away the treatment time.

Thus, with the exception of the already mentioned efficiency of energy action, availability of a sustained unwavering heat without danger, ease of insertion into the female pelvis and inexpensiveness of the unit, I know of no other definite superiorities of radiant energy over conduction forms of heating for pelvic lesions.

PHYSICAL THERAPY ABSTRACTS

The Kenny Treatment. Don W. Gudakunst.

Mod. Hosp. **59**:54 (Sept.) 1942.

The National Foundation for Infantile Paralysis has sponsored the work of Miss Kenny in this country. She and her staff of assistants have been maintained at the University of Minnesota out of funds made available through the foundation. The medical advisory committee of the foundation have reviewed the results of her form of treatment and have recommended that this method be made available to the people of the United States. To that end training programs have been established by the foundation whereby technicians can be taught and doctors and nurses can be made familiar with their phase of the program. The foundation has been able to procure a limited amount of woolen material, which can be supplied to hospitals using the Kenny method of care for infantile paralysis victims.

In addition to this, the foundation stands ready to render assistance in the form of consultation and advice in preparing and assisting hospitals to meet the problems that arise in the face of epidemic conditions.

Infantile Paralysis—Importance of Treatment in the Acute Stage. Sister Elizabeth Kenny.

New York State J. Med. **42**:1645 (Sept. 1) 1942.

In summing up the evidence it has been proved by the research carried out by Drs. McCarroll and Crego that a higher percentage of apparent recoveries can be obtained when no treatment has been given according to all orthodox methods, and the highest percentage of recoveries was 19, which was obtained with no treatment. The evidence available from the research carried out at the University of Minnesota Medical School proves that with the Kenny system over 80 per cent recoveries have been obtained in the bodily extremities. In the trunk muscles, according to the research carried out by Drs. McCarroll and Crego only 3 out of 42 patients recovered normal trunk muscles and 21 of these patients developed a definite scoliosis. It is recorded and the evidence was shown to the group of medical representatives already mentioned that by the Kenny system 100 per cent recoveries have been obtained in all trunk and neck muscles, and this recovery was permanent. There had nto been one case that retrogressed or developed any degree of deformity.

The evidence produced in this paper is evidence submitted in the first place by Drs. McCarroll and Crego with regard to the results obtained by orthodox treatment, and this evidence proves that no treatment has been more beneficial than any type of orthodox treatment. The evidence submitted with regard to the Kenny treatment and the results were witnessed by the medical observers, already mentioned.

Renal Tuberculosis. Eli A. Miller.

Rocky Mountain M. J. **39**:421 (June) 1942.

Pre-clinical tuberculosis and bilateral renal tuberculosis should be treated medically. If no real destruction has taken place, the patient should have the benefit of careful medical care and be placed in a sanatorium where he may have the advantage of supportive hygienic treatment and heliotherapy. Spontaneous healing may take place in early renal tuberculosis. If a destructive lesion supervenes during medical treatment, or as happens more often, the patient originally has a destructive lesion, surgical measures should be instituted. The treatment of destructive renal tuberculosis is always surgical and nephrectomy should be performed unless the patient's general condition contraindicates this form of therapy. The body has the power of developing through general hygienic measures aided by heliotherapy a decided resistance to the action of the tubercle bacillus. Such resistance should be encouraged and raised to a maximum before surgical measures are employed.

In the study reported the majority of the living patients had unilateral renal involvement and nephrectomy had been performed. The course of the renal tuberculosis in the 19 operated cases was as follows: Eight or 43 per cent were arrested and are working; 6 or 31 per cent were healing, and 5 or 25 per cent died. Of the 5 fatal cases, 3 died within two years after nephrectomy; of these, 1 died of postoperative pulmonary atelectasis with cardiac failure and the other 2 of uremia. The remaining 2 died three years after the nephrectomy, one of uremia and the other of asthenia. Of the 15 non-operated cases, 4 or 27 per cent lived and healed and 11 or 73 per cent died. Of the dead, 9 or 56 per cent died of uremia and 2 or 19 per cent of asthenia. In the living nephrectomy cases, the large majority have lived from two to fifteen years after the onset of renal tuberculosis. The majority of the non-operated cases have lived after a two to five-year period only.

Fatigue, Rest and Exercise. Trevor Own.

Canad. M. A. J. **47**:41 (July) 1942.

Rest from athletic fatigue means the total inactivity of the body and mind for a period which has definite limits. In organic fatigue, namely, that due to toxic states due to infection, degeneration, or new growth, or to poisoning from endogenous sources, rest is also that of an inactivity

of the part and of the whole patient until the source of the intoxication are repaired and the metabolism of the cells is restored to normal. As soon as the toxins are removed or prevented from forming, the convalescent state begins. This rehabilitation period, called the convalescent state, is a period of change and requires a nice adjustment between rest and increasing exercise of the part and the whole of the patient. The fact that the whole person is taking part in the convalescence is often overlooked. Graduated use of the various faculties and physical properties of that person have to be used in greater frequency and in increasing difficulty. This is analogous to the early part of an athlete's training. During the convalescent stage from infection or other toxaemias, many of the psychoneurotic states originate in healthy people. The previous toxic state has resulted in a disintegration of function of the various systems and of the cells in each system and, following the removal of that toxaemia, this functional fatigue remains. The restoration of this liability to functional fatigue may well be met with the ordinary natural tendency of the individual to recover spontaneously. But, if the period of previous toxaemia has been prolonged, even those who have strong autonomic nervous systems and constitutional organization, may yet require careful coaching in the reeducation or exercise process to avoid the habitual functional fatigue symptoms which are necessarily and normally present at the beginning of the convalescent stage. It can thus be seen, too, that in long continued, chronic, organic disease and in suitable personalities, functional fatigue symptoms overtake and overshadow finally the organic symptoms. Frequently, however, the distinction between the organic symptoms and the functional fatigue symptoms is not clearly distinguished by those who come in contact with the patient. Therefore, there is a possibility that the whole complex clinical picture becomes a mixture of functional, that is to say secondary psychoneurotic, symptoms combined with the organic symptoms and the latter may fade in reality to the vanishing point. The onus having started with the organic disease, symptoms may still be thought to be treatable on the basis of the original organic lesion, but specific treatment directed towards the organic lesion will not, of course, have any effect on the secondary and now more urgent and possibly overwhelming symptoms of functional nervous disturbance.

The word "rest," is used rightly when applied to the fatigue of organic disease. Inactivity, however, is not restful for the organization that is suffering from functional fatigue, and becomes but an opportunity for deterioration. In functional nervous disorders, rest is only obtained by using all parts, including the mind and nervous system of the organism in the way that they were supposed to be used, beginning with a small amount and increasing the difficulty and the duration until a normal level of usage is arrived at. Together with this, frequent changes in the kind of energy production is the only way of producing a restful effect. Anxiety or fear and boredom (monotony) are the greatest producers of functional fatigue.

Heat and Electricity in the Treatment of Nerve Lesions. P. Bauwens.

Brit. J. Phys. Med. **5**:48 (March) 1942.

Provided the circulation in a paralyzed limb is capable of being accelerated, a rise in temperature and efforts to keep this near to the normal constantly are indicated, in order to promote repair, facilitate movement and increase excitability.

This is best achieved by warming the limb in the ultra high frequency field provided by coil electrodes. Other methods are available and their efficacy is a function of their capacity to enable heat to reach deep structures without steep temperature gradients, which are hazardous in the presence of anesthesia. These provisos are not adequately satisfied with methods employing radiant heat or classical diathermy. It is not enough to warm merely the affected or cold part of a limb, as much as possible of the portion above the level should be treated so as to enhance the circulation generally. Between treatments, which should be given twice daily, every effort should be made to prevent heat losses from limbs by encasing them in sleeves or muffs made of heat-insulating materials and padded after the fashion of tea cosies.

The Effect of Exercise in Hot Atmospheres Upon the Salt Water Balance of Human Subjects. Douglas H. K. Lee; R. E. Murray; W. J. Simmonds, and R. G. Atherton.

M. J. Australia **2**:249 (Sept.) 1941.

A hot wet atmosphere is the cause of much less strain on the salt water balance of a person than is a hot dry atmosphere of the same effective temperature. That such a reduction does occur with acclimatization has been suggested by other workers. It might be of importance to examine newcomers to the tropics some time after their arrival, in order to determine whether such an acclimatization had occurred, especially if personnel is being selected for a long period of arduous work in a hot dry atmosphere with poor supply facilities. The sporadic occurrence of heat cramps in stokeholds and the experiences on the Boulder Dam construction suggest the wisdom of this procedure. As in the case of the pulse rate, afternoon exposure makes greater demands upon the salt water balance than morning exposure. — (Abstr. Arch. Pediat. **59**:274 [April] 1942.)

Electrically Induced Convulsions for the Treatment of the Functional Psychoses. J. V. Edlin.

Illinois M. J. **81**:216 (March) 1942.

The author is of the opinion that the same care in fixation is needed for electrical therapy as with metrazol therapy, particularly during the first surge that occurs with the press of the treatment button. Fully one-third of the patients receiving

electrical therapy and improving to the point of where they were in excellent contact, frequently asked the author when their treatments would be terminated. They stated that they would not object to the continuation but at the same time said that it was unpleasant in some undescribable fashion. Although rubber gloves and clipping of the hair do not appear necessary, one patient was given therapy with hair unclipped at the request of the relatives with a resultant jagged blue flame that swept down from her temple to her chin. Nothing happened, but the author was left with the impression that if any precautions for safety can be taken, they should be.

The percentage of recoveries in involutional melancholia, dementia praecox, catatonic and dementia praecox, undetermined in type, definitely appear to be higher than the percentage noted with spontaneous remissions. Although the group of patients classified as dementia praecox, hebephrenic in type and paranoid was small, the results were sufficiently discouraging as to warrant the author's recommendation that they be placed on insulin therapy. The author recommends electrical therapy in preference to metrazol because of the percentage of recoveries in selected cases and the almost total absence of fear. The author believes, as does Victor L. Gonda, that psychotherapy is a necessary and vital adjunct to electrical therapy.

Brucellosis Spondylitis. Treatment by Physically Induced Hyperpyrexia. George S. Phalen, Louis E. Prickman, and Frank H. Krusen.

J. A. M. A. **118**:859 (March 14) 1942.

We fully realize that the accuracy of the diagnosis in these 3 cases may be open to some question. The diagnosis in each case is based chiefly on the presence or history of remittent fever, the local signs and symptoms of spondylitis, a high sendimentation rate and the presence of a high titer of specific agglutinins for brucella organisms in the patients' blood. That spondylitis in these 3 cases was caused by the brucella infection is more or less proved (1) by the fact that prompt remission of the symptoms of spondylitis occurred in each case following fever therapy, (2) by the fact that this therapy has been shown to be effective in most cases of brucellosis without bony lesions in which the treatment has been employed at the clinic. Furthermore, evidence that the organisms of brucellosis were present in the 3 cases presented herein is adduced by negative exclusion: physically induced hyperpyrexia has not been effective in control of the symptoms of the common forms of spondylitis, either the atrophic or the hypertrophic types, in which the organisms of brucellosis are not the causative agents.

On the basis of the small series of cases reported here it could not be stated that employment of fever therapy hastens the healing of pathologic lesions in the spinal column in the condition under consideration; but certainly the great diminution of the extent of pain in the back and the lessening of the paravertebral muscular spasm following this treatment would lead to the conclusion that the infectious process was at least arrested by such therapy. The prompt relief which immediately followed the fever treatment in each of these 3 cases could scarcely be said to have been the result solely of coincidental spontaneous remission.

It is recognized that, even if no special treatment is employed, the prognosis as to ultimate healing in brucellosis spondylitis is good. We believe, however, that physically induced fever was of very definite value in the management of the 3 cases previously mentioned. To our knowledge, no patient suffering from brucellosis spondylitis has been so treated previous to this report.

Resuscitation in Advanced Asphyxia. Comparison of Methods. George L. Birnbaum; Samuel A. Thompson, and Eugene Ostrow.

J. A. M. A. **118**:1364 (April 18) 1942.

Because of the confusion which exists on the subject of resuscitation, the authors have undertaken a series of experiments in an attempt to clarify this problem. They present experimental findings in a series of papers of which this is the first. Later papers of this series deal with the role of positive and negative phases in resuscitation in asphyxia with cardiac failure and the phenomenon and mechanism of resuscitation with inert (asphyxiating) gases, carbon monoxide asphyxia, resuscitation in electric shock and the relief of atelectasis.

In this paper they present some fundamental comparisons of methods of resuscitation in (1) obstructive asphyxia and (2) inhalation asphyxia with nitrogen, helium and nitrous oxide. Since drowning is essentially a variety of obstructive asphyxia both as to its mechanism and as to its treatment, it requires no additional consideration other than measures to overcome spasm of the larynx and to clear the airways of fluid. Manual artificial respiration with oxygen inhalation instituted at the critical point resulted in recovery in 55 per cent of the animals.

Rhythmic inflation with oxygen instituted at the critical point resulted in recovery in 78 per cent. Rhythmic suction with oxygen was successful in 80 per cent. Mechanical (positive-negative) resuscitation with oxygen was successful in 95 per cent of the animals when applied as a primary procedure.

Graduated Exercise in Tuberculosis. Albert Martin.

M. Bull. Vet. Admin. **18**:394 (April) 1942.

Sanatorium physicians of wide experience appear to favor the liberal use of graduated exercise for selected patients having average normal pulse, temperature and weight graphs, regardless whether the roentgenograms show traces of active infiltration. The criterion, in short, is the comparative freedom of the patient from serious constitutional symptoms. This viewpoint may largely be engendered by economic considera-

tions; i. e., by the desire to return these patients to their former positions of employment in their home communities, or to other positions less apt to cause reactivation. Quite often, such sanatoria patients are being treated at the expense of a firm or corporation, whose officers wish the return to work of the employee as soon as possible. And those patients who have a proper sense of responsibility are equally desirous of being dehospitalized as promptly as may be.

The main argument in favor of the early administration of graduated exercise in selected tuberculosis cases is the comparatively large number of living examples who are leading useful and successful lives. The liberation of tuberculotoxins during the period of prescribed graduated exercise appears, in many cases, to have a beneficial effect.

Expectancy of return to a remunerative economic status, to a life of real usefulness, has a salutary effect upon the mind, body and soul of a patient.

The chest roentgenogram and fluoroscopic examination, while to be given ample consideration should not in all cases be the sole or chief criterion in determining whether some form of surgical collapse or a course of prescribed graduated exercise is to be undertaken.

The opinion of the clinician who has daily observed the patient over extended periods has made the usual periodic check-up physical examinations, and has studied all the important daily graphs of the case, is entitled to as much weight as the opinions of the thoracic surgeon and the roentgenologist in the final decision as to inducing surgical collapse or beginning graduated exercise.

Electrotherapy in Schizophrenia. Joseph L. Kubanek, and Samuel H. Ruskin.

J. Nerv. & Ment. Dis. **95**:698 (June) 1942.

Several months ago the first experimentation was begun with an apparatus which was developed for Dr. Frederick Schrieber by the Detroit Edison Company and is identical with the type of apparatus used by the Italian workers.

Up to the present time 10 patients have been treated and they have received an aggregate of 174 treatments. Of these 86 have been convulsive in type, while the remainder have been subconvulsive in nature. There has been no complications noted with the exception that one patient had a dislocation of her jaw during the yawn which preceded the convulsion. This, however, was easily reduced. Of the 10 patients only 2 were recent admissions. Of the remaining 8, 4 had insulin shock treatment without any improvement. Of the remaining 4 patients, 3 were schizophrenics and 1 was suffering with involutional melancholia. One of the schizophrenics has been hospitalized for eleven years, one for eight years, and the others for four years. The case of the involutional melancholia has been in the hospital for approximately eighteen months and has been sick for approximately two years before admission. Of these 10 patients 9 have shown from moderate to slight degree of improvement. One has shown no improvement.

Infectious Diseases. A Review of Significant Publications in 1941-1942. Hobart A. Reimann.

Arch. Int. Med. **70**:132 (July) 1942.

Wells, Wells and Wilder report further study of the effects of radiant disinfection of air as a method to prevent the spread of contagious disease. The results were gratifying in that no contagious disease occurred among children in irradiated groups in two schools, while measles and mumps occurred among the controls. The primary object was not to postpone contagious diseases to later childhood, though this may at times be desirable, but to test the hypothesis that contagion may be controlled by irradiation, as in army barracks and among groups in which immediate protection against disease may be imperative.

Buchbinder reviews modern work showing how important airborne infection is and that the old "contact" theory of spread of infection is not adequate. He points out the germicidal effectiveness of sunlight and even of diffuse daylight.

In another practical application of prophylaxis against air-borne infection, air conditioning alone failed to prevent acute cross infections of the respiratory tract in infants, but air conditioning together with germicidal light barriers or with mechanical barriers was effective.

Pityriasis Rosea: Treatment With Baths in Bichloride of Mercury Solution. Richard L. Sutton.

South. M. J. **35**:597 (June) 1942.

Routine treatment nowadays is irradiation with ultraviolet light and this is effective. If the skin is caused to peel, the disease goes with the scales. Some blonds would prefer to suffer the disease rather than its treatment by sunburning.

For pityriasis rosea the author gives a prescription calling for one ounce of mercuric chloride in sixteen ounces of water in a graduated bottle, labelled "P—2 ounces to 15 gallons of cool water for ten minute baths twice a day." It is carefully explained that the bottle contains enough poison to kill 100 men if taken internally. It is often necessary to reassure a pharmacist that a whole ounce of bichloride is intended. The patient is requested to measure fifteen gallons into the tub, using an ordinary bucket which holds three gallons, or using a quart milk bottle emptied four times into a pail to measure one gallon. After the first bath, water may be drawn to the same level without formal measurement. The bath is to be lukewarm. No soap is used with the medicinal bath, but soap may be used separately as desired. The patient is to immerse himself in this dilution, which is about 1:15,000, twice a day for a period of ten minutes by the clock. Stronger concentrations are irritating.

A Physical Therapy Unit for an Industrial Area. P. Godfrey Savage.

Hospitals **16**:52 (May) 1942.

Through the generosity of a friend and aid from a special capital fund, the Niagara Falls Memorial Hospital has been able to establish a new physical therapy department to meet the local needs. The building is constructed with brick and glass blocks and has a northern exposure. The six cubicles are screened except that one has a metal door where the electric surgical machine is located. In this area the equipment for the various treatments is installed. A list of equipment is given, as well as a plan of the department.

Electric Shock Therapy by Cerletti's Method. O. L. Forel.

Zentralbl. f. Psychotherap. **12**:267, 1940.

Electric shock therapy has been used at Forel's clinic since the beginning of 1940 and its results were found to be superior to other methods of shock therapy. The application is rapid and simple; there has not been a single fatality; there is a complete and permanent amnesia regarding the shock. It is possible to repeat the shock on the same or the next day, although repetition after two days is preferred. The patient generally does not object to repetition of the treatment. It is useless to continue the method if the result is negative after from five to fifteen shocks. The indications for electric shock are the same as for other forms of shock therapy. Psychotherapy is an indispensable accompaniment of the electric shock therapy. Patients should not be told about the epileptic convulsions. The patient knows that it will induce sleep and that he will wake up without recollecting what has happened. The apparatus should be kept out of sight. The patient's awakening, which is frequently accompanied by "primordial anxiety," deserves particular attention, because in the hours following it he is particularly amenable to psychotherapy. The changes in behavior and emotions give the impression of a catharsis: there is a relative release which makes possible an approach to the subconscious. — (Abst. J. A. M. A. **119**:598 [June 13] 1942.)

Treatment of Delirium Tremens. N. J. Berkwitz.

Ann. Int. Med. **16**:480 (March) 1942.

Berkwitz used faradic shock for the treatment of 33 patients less than fifty-five years of age with uncomplicated delirium tremens following alcoholism. One electrocardiograph electrode was applied to the forehead and another to the back of the neck. A series of fifteen sub-convulsive electrical shocks was given with a faradic current of half a second duration at intervals of half a second. The patient received an average current of about 10 milliamperes in each shock. Immediately after electrical shock an intravenous injection of 8 to 10 cc. of a 5 per cent solution of pentothal sodium to produce general anesthesia for three to five minutes was given. For a few minutes after awakening the patient was usually confused and poorly coordinated. As the effects of the pentothal sodium wore off, the patient's apprehensiveness, hallucination and tremors diminished or were absent. Shock treatment was repeated daily until all apparent symptoms of delirium disappeared. Forty-three similar patients were given only the routine medical treatment. Among the 76 patients there was only one death of a patient who did not receive faradic shock treatment. The mean number of days that strong sedation was required by the group receiving shock treatment was two and twenty-one hundredths as compared with five and five hundredths days. After the first treatment strong sedation was needed only for six tenths of a day. This low figure strongly indicates the effectiveness of the treatment. Experience with the faradic treatment has shown that the necessary "protective" measures (chemical and physical restraints) often aggravate or prolong the condition. Shock therapy promptly removes the acute psychotic symptoms in most cases and consequently lessens the need for these undesirable protective measures. — (Abst. J. A. M. A. **119**:750 [June 27] 1942.)

Scalenus Anticus Syndrome or Cervical Foraminal Compression? I. William Nachlas.

South. M. J. **35**:663 (July) 1942.

The syndrome of pains radiating to the shoulder and adjacent areas, for which the name "brachialgia" is suggested, is not a disease entity, but is the result of inflammation or pressure on the nerves in the cervical region.

The scalenus anticus muscle is not primarily responsible for the pressure phenomena and scaleniotomy is not etiologic treatment.

The symptom complex is frequently observed and can be usually associated with lesions of the cervical spine that produce intervertebral foraminal compression of the nerve roots.

Treatment should be directed to the correction of the etiologic factor but, in addition to this, an effort should be made to relieve the pressure on the nerves at the cervical foramina. Since hyperextension of the neck opens these spaces, mechanical devices that can do this should be considered. Postural treatment in bed, strapping the neck in hyperextension and the Thomas collar are all useful. Physical therapy is quite helpful. In resistant cases the use of head traction is particularly valuable. After the acute stage is over education of the patient to proper posture with muscle training and rehabilitation are indicated.

The Kenny Treatment of Anterior Poliomyelitis (Infantile Paralysis). Report of the First Cases Treated in America. John F. Pohl.

J. A. M. A. **118**:1428 (April 25) 1942.

As a result of the demonstration carried out at the Poliomyelitis Clinic at the Minneapolis General Hospital for eighteen months beginning in the fall of 1940, it can be stated that:

1. Miss Kenny has conclusively shown that spasm is the condition affecting the muscles in the acute stage of infantile paralysis. Spasm is the cause of deformities. Spasm causes mental alienation of muscle, a pseudo-paralysis occurring in the opposing muscles to those in spasm, in which those opposing muscles are divorced from the voluntary motor pattern and cease functioning. Spasm plus mental alienation causes incoordination of muscle action, resulting in further damage to the motor mechanism.

2. Miss Kenny has demonstrated a method of treatment for the symptoms she describes which diminishes the crippling after-effects of the disease of infantile paralysis.

3. At the end of eighteen months after beginning the Kenny treatment of a series of 26 patients in the acute and subacute stage it can be stated that these patiens have all made a far more satisfactory recovery than they would have made by any previously known method. No deformities have occurred, in spite of the complete omission of splinting.

4. The methods as demonstrated form a complete system for the treatment of the neuro-muscular aspects of the disease.

5. Incorporation of the principles of the Kenny method with those of other methods for the treatment of infantile paralysis would prove unfeasible, as the Kenny method is based on previously unrecognized symptoms of the disease.

6. The method should be immediately adopted as the fundamental treatment of the disease of anterior poliomyelitis. As the condition affecting the muscles appears with the onset of the disease, it is imperative that treatment be instituted as soon as the diagnosis is established.

An additional series of 28 cases occurring in the fall of 1941, all coming under treatment in the acute stage, have presented satisfactory progress to date. These cases will show even more remarkable recovery when viewed at the end of the treatment period. The fact that these cases were treated early and that the medical and nursing staff were better prepared to carry out treatment by virtue of the experience gained with the 1940 series will insure a maximum recovery in the 1941 series. These cases will be reported in detail later.

The Treatment of Acute and Chronic Salpingitis. A. B. Nash.

Canad. M. A. J. **46**:554 (June) 1942.

Consideration should perhaps be given to the suggestion made by some authorities that heat therapy, such as Elliott heat treatment, should be employed in the acute phase of this disease. It would seem that the proponents of this suggestion are in the minority and that enthusiastic reports as to a shortened and ameliorated acute stage have not been abundantly confirmed.

Whatever method of treatment is employed, its effectiveness will be minimized by physical exertion, fatigue, alcohol and sexual stimulation. In the author's experience, the sulfonamide drugs are of limited value in the truly chronic salpingitis or pelvic inflammatory disease of gonococcal origin. Various forms of locally or generally applied heat treatment are apparently not without some merit. Of these, fever therapy is perhaps the least utilized and is the most hazardous. The basis of its use is the lethal effect of relatively low temperatures upon the gonococcus without simultaneously damaging effects upon the tissues. It is expensive, its application requires considerable technical skill and it is most time-consuming. More important, however, is the fact that it is not without risk, several deaths having been reported in connection with its use.

Elliott heat treatment and inductothermy are more simple of application and with reasonable minor precautions, neither is attended by any appreciable hazard. The author's experience prompts the suggestion that, of the two, the former is most efficacious. Either is probably helpful only as a stimulus and fortification to the natural tissue reaction in dealing with any inflammatory process and not because of any possible specific lethal effect upon the gonococcus.

Superfluous Hair. Marthe Erdos-Brown.

Arch. Dermat. & Syph. **46**:496 (Oct.) 1942.

Epilation with the diathermy current has been slow to become popular because most apparatus until fairly recently has been made for high intensity current and has been of the spark gap type. The current from the spark gap machine is not steady or constant. It occurs in recurrent bursts of energy. Each discharge energizes the circuit. This is followed by another wave train which again dies out. This series of events continues as long as power is supplied to the machine. The rate at which the wave train diminishes is known as damping. The current from all spark gap machines is damped, that is, intermittent and irregular, and the wavelength is not constant or sharply defined. Diathermy current passed through the body distributes itself in inverse proportion to the impedance of the path of the current. In passing through the body, some of the electrical energy is induced within the mass of tissue. In the light of present day knowledge it is safest to assume that the physiologic effects of diathermy current are due primarily to the heat and attendant phenomena caused by the application of the current.

It is possible to perform epilation with the spark gap diathermy machine, but two electrodes are necessary and one of these must be a directly applied and tightly bandaged metal applicator.

The energized needle methods of removing superfluous hair are discussed. The diathermy needle method of epilation deserves more widespread use. The technic is simple. One terminal is sufficient. It is faster than electrolysis. Diathermy is at least as safe as any needle method. Multiple needles are not needed, since the treatment time per hair is almost instantaneous. The cosmetic effect is excellent.

Muscle Spasm in the Acute Stage of Infantile Paralysis. As Indicated by Recorded Action Current Potentials. R. Plato Schwartz, and Harry D. Bouman.

J. A. M. A. **119**:923 (July 18) 1942.

Action currents are among the means most suitable for recording extremely minor contractions of muscle in situ. The rigid principles that define the technic of this method were applied to the study of patients: (1) 7 with infantile paralysis, (2) 3 with spastic paralysis and (3) normal subjects for control.

In all instances oscillographic records of muscle action currents were made through a four stage amplifier. This amplifier has a balanced input system which reduces those potentials not generated between the electrodes applied to the skin overlying the muscle under investigation. Stetson and Bouman have shown that it is quite possible to make records of different muscles without significant interference from the related antagonist.

A particular pattern of action current records is established as definite evidence of muscle spasm. In some instances spasticity can be recorded in muscles at rest. However, Hoefer has revealed that even in spastic paralysis it is usually possible to find a position of complete relaxation in which characteristic action currents are almost completely absent. Independent of cause and degree, muscle spasm in a muscle will be revealed in the action current records made on passive movement of the muscle. Under this condition the muscle does not actively contract, so there is no action current of voluntary contraction in such a record. The most common way of evoking spasticity in a muscle is by a fairly sudden stretching of the muscle.

In their conclusions the authors' stated that in infantile paralysis spasticity of the muscles exists not only in the antagonist of the weakened muscle but also in the weakened muscle and in muscles in parts of the body in which clinical symptoms of the disease are not evident. The spasticity is of a reflex nature and is not present in the completely paralyzed muscle. The spasticity can be stronger than the voluntary contraction that the muscle is able to perform, as adjudged by action currents. When the strength of the voluntary contraction increases through treatment, the spasticity decreases.

The authors' investigation has shown that spasticity is present in infantile paralysis. Whether the spasticity is actually responsible for weakening of the muscle or whether it is a phenomenon which is merely another consequence of the disease is a question which cannot be answered at the present time.

Postabortional Sepsis. E. W. Rebbeck.

Am. J. Surg. **55**:476 (March) 1942.

From July 1938 through July 1941 Rebbeck used ultraviolet irradiation of autotransfused blood as an adjunct to surgical intervention in the preoperative treatment of 17 and the postoperative treatment of 4 patients with postabortional sepsis. Nine patients admitted instrumentation to produce abortion, 2 admitted taking medication, 8 had apparently spontaneous abortions, 1 patient with psychosis was treated after a therapeutic abortion because of apparent sepsis and 1 used medication and instrumentation. Ten patients were in a state of advanced infection on admission and 11 had early to moderately advanced infection. The pathologic condition ranged from simple, uncomplicated, acute septic endometritis to acute salpingitis, bilateral, "frozen" pelvis, pelvic abscess and septicemia. Following preoperative irradiation of the blood, infection did not spread. The 4 patients treated postoperatively were promptly relieved of toxemia, and their fever decreased. The temperature and toxemia of these 4 patients increased after operation and they were treated postoperatively because of apparent acute endometritis. The other patients had no significant rise of temperature, although their blood was irradiated immediately or up to nineteen days before operation. The results strongly indicate the preventive value of irradiating autotransfused blood. The patients were discharged from four to eight days after curettement. — (Abst. J. A. M. A. **119**:524 [June 6] 1942.)

Treatment of Lymphogranulomatous Strictures of the Rectum With Short Wave Diathermy. Richard T. Shackelford and J. Arthur Weinberg.

Am. J. Surg. **47**:83 (July) 1942.

Almost every form of chemical, biological, radiological, electrical, surgical and physical treatment has been used without very promising results after secondary manifestations have developed. Recent reports have offered attractive results with the use of the sulfonamides but the experiences of the authors with these have not been good when used late in the disease. The authors decided to treat some of the cases with rectal strictures with diathermy. A short wave machine was used. A metal plate connected to one pole of the machine was applied to the lower abdomen and the other pole was connected to a Hegar dilator which was inserted into the strictured area. The largest dilatur that could be inserted without causing the patient too much discomfort was used. Treatments were given from two to six times per week for a period of twenty minutes each, as much current being used as the patient could tolerate. Five patients were treated in the above manner and 2 patients were used as controls.

Two patients were used as controls and one of these showed the most marked improvement of any and demonstrated little evidence of recontraction of her stricture. The other control showed temporary improvement at the end of her treatment but within three and one-half months the stricture had recurred to the same caliber as before therapy was begun.

From these facts the authors concluded that diathermy treatment per se to rectal strictures of lymphogranulomatous etiology, in their experience, offers little if any curative effects. They

believe that what benefits did result are primarily the effect of more frequent and prolonged dilatations than they had used in the past.

Subacute Bacterial Endocarditis Due to Streptococcus Viridans. A Survey of the Present Status of the Previously Reported Cures and a Clinical Study of Fifteen Treated Cases, Including Another Cure. Carter Smith; H. Cliff Sauls, and Charles F. Stone.

J. A. M. A. **119**:478 (June 6) 1942.

Smith and his associates reached the following conclusions:

1. There has been a gradually decreasing mortality rate in subacute bacterial endocarditis since the advent of the sulfonamides.

2. The literature has been searched for authentic instances of cure of subacute bacterial endocarditis due to streptococcus viridans and 35 reports were found. The authors of these reports were written to and follow-up notes to date have been obtained.

3. The clinical records of 15 patients treated by several physicians at the Piedmont Hospital and Emory University Hospital which have been tabulated show that there were *2* patients who recovered in this group.

4. Various therapeutic procedures have been used in combination with the sulfonamides including heparin, neoarsphenamine, hyperpyrexia by diathermy, and hyperthermia with typhoid-paratyphoid vaccine. The latter is most recent and in a small series of cases has afforded the best recovery rate. Because of increased tolerance without decreased efficiency, sulfadiazine with intravenous typhoid is probably the method of choice at the present time and should receive extensive clinical trial.

5. Clinical trial on larger groups of patients with the combined use of sulfadiazine and the intravenous use of typhoid-paratyphoid vaccine should be carried out. This method has so far offered the best recovery rate, but the number of patients treated in this manner is too small to justify final conclusion at this time.

6. Surgical ligation must be considered for those patients having patent ductus arteriosus associated with subacute bacterial endocarditis.

Chemotherapy of Female Gonorrhea. D. Smith and R. Deakin.

Am. J. Syph., Gonor. & Ven. Dis. **26**:309 (May) 1942.

A big portion of 110 women whom Smith and Deakin found infectious have become patients because they were named as sources or contacts by men under treatment in the male section of the clinic. Gonorrhea in both the male and the female is treated as a unit of the general work of the clinic, following a definite medical and social routine. The lapse rate is extremely low (less than 10 per cent) owing to a systematic case holding program. There is no police regulation or coercive control. The responsibility for medical care is shared by a gynecologist and a urologist. The women were mainly in the second and third decade; the youngest was 14 and the oldest 44. They were nearly equally divided between the white and Negro races. The routine treatment is as follows: After the diagnosis is made the patient is given 1 Gm. of sulfathiazole four times a day for five consecutive days. Criteria of cure are the absence of clinical evidence of infection, negative smears and cultures from the urethra and cervix at weekly intervals for three weeks and at monthly intervals for three months. A single course of 20 Gm. of the drug given to 70 women gave a known cure in 44, a probably cure in 21, there were 3 failures and 2 were unable to take the drug. If the patient is not rendered noninfectious by such a single short intensive course of chemotherapy, nothing is gained by prolonging such medication or returning to it in the event of a relapse, for which local, focal, surgical and fever therapy all have a place. Fever therapy has been most effective in sterilizing stubborn types of infection resistant to chemotherapy and to local and focal measures. It is especially indicated when the patient is threatened with permanent crippling of a joint or with blindness. In spite of all the therapeutic measures an occasional woman will have a pelvic abscess that requires surgical drainage. Laparotomy must be the procedure to relieve the semi-invalidism of the person with a retroverted uterus and prolapsed adnexa bound down by extensive adhesions between the pelvic and abdominal viscera. — (Abst. J. A. M. A. **119**:973 [July 18] 1942.)

Minimizing the After Effects of Acute Poliomyelitis. A Rationalization of the Kenny Treatment. Philip Moen Stimson.

J. A. M. A. **119**:989 (July 25) 1942.

The causes of the more obvious spasm that apparently involve an entire muscle or the greater part of it are not clear. There are many theories at present, involving reflex action, irritation, circulation, inflammation and anoxia, which do not need to be gone into at this time. But whatever the cause, spasm certainly is constantly present in early poliomyelitis, being found in the muscles of the neck and the back and in the hamstrings as well as in a variable number of other groups of muscles. It is found both in muscles most of whose motor neurons are definitely weakened or paralyzed and in those without any evidence of weakness.

Spasm causes dysfunction not only of the muscle that is in spasm but also of its antagonist, which may be overstretched and rendered noncontractile. For instance, spasm of the biceps affects the use not only of the biceps but also of the triceps. By oscillographic recordings of action currents, Schwartz and Bouman of Rochester, N. Y., have recently proved that in the acute stage of poliomyelitis spasticity is found not only in the antagonists of weakened muscles but also in the weakened muscles themselves and furthermore in muscles elsewhere in the patient which show no clinical evidence of weakness.

Spasm is aggravated by pain and tenderness,

by attempts at active motion, by forced immobilization as by casts and splints, also considerably by massage and by electrical stimulation. If untreated, muscle fibers in spasm may become hard and inelastic and may comprise the bulk of a muscle; eventually, some may show fatty replacement, others fibrous degeneration. Hipps also has described "stretch tears," or minute ruptures of bundles of muscle fibers due to the force of a slow, continued stretch. If spasm is allowed to persist, permanent contracture and further loss of function ensue.

A most important part of the treatment of an early acute case of poliomyelitis is management of the morale. There are few illnesses which so greatly shake the courage of a patient's parents, and sometimes of the patient, as does poliomyelitis. With patients on the Kenny treatment, the maintenace of morale is easier than in former years, because the patients are more comfortable and are more hopeful from the start; but there are bound to be those destined to be left with limitations, despite the best care.

The Treatment of Psoriasis. Clyde L. Cummer.

Ohio State M. J. **38**:754 (Aug.) 1942.

Psoriasis is one of the skin disorders which physicians in general practice are called on to treat frequently. The process is an inflammatory one, characterized by brownish red to red papules (punctate and guttate lesions), circumscribed plaques, or even very large areas covered with silvery white, overlapping adherent scales, as in inveterate psoriasis.

Unfortunately the cause is not known. While many theories have been advanced, including bacterial or fungus infection, metabolic disturbance, endocrine or vitamin deficiencies, none has been adequately confirmed, although much investigative work has been done. There is no evidence that the disease is transmitted from one person to another by contact, but the tendency to it is probably hereditary.

The only internal medication of proved value is arsenic. This may be given in the form of Liquor Potassii Arsenitis.

In all cases reliance must be placed on topical remedies. While none is specific, the most effective are those which employ detergent or stimulating agents. These include salicylic acid, iodine, ammoniated mercury, chrysarobin, sulphur, and various tars.

Of all topical remedies probably the most efficient is chrysarobin but it has the great disadvantage of staining and of often being unexpectedly irritating.

For many years tars have been almost a sheet anchor in topical therapy. Efficient preparations are those containing crude coal tar, from 5 to 10 per cent, in zinc oxide ointment.

Eruptions of generalized and universal psoriasis have responded better to the tar bath of Goeckerman and O'Leary than to any other treatment so far introduced. The entire surface of the body is anointed with a two per cent ointment of crude coal tar at night. On the following morning this is removed with olive oil, leaving a thin film on the affected surfaces, and the entire body is exposed to ultraviolet radiation. Treatments are given daily. For generalized eruptions, hospitalization is almost necessary. The treatment may be modified for smaller areas. Recently a single patch of inveterate psoriasis which had been singularly resistant to many forms of treatment cleared up rapidly after painting the area with Liquor Carbonis Detergens (Liquor Picis Carbonis N. F.), following this with ultraviolet radiation, the treatment being repeated at one to two-day intervals.

The efficacy of roentgen ray therapy is undeniable. If it has been employed before, especial care must be taken not to go above the limit of safety. The lesions seem more resistant after previous radiation. The very danger of this form of treatment is its effectiveness, for many patients demand repetition because of the saving in labor to themselves and the avoidance of unpleasantly greasy ointments.

The Role of Orthopaedic Appliances in the Treatment of Infantile Paralysis. Henry H. Jordan.

New York State J. Med. **42**:1651 (Sept. 1) 1942.

The overemphasis placed on the economical phase leads to the question whether or not standardization of braces for infantile paralysis is desirable.

The question may be answered in the affirmative as far as standard splints for use in the acute stage of the disease are concerned. The question must be answered emphatically in the negative, however, for the orthopaedic appliances to be used as temporary or permanent braces in the chronic stage.

In order to substitute efficiently for loss of physiologic function in posture and locomotion, the brace must become a part of the person's body. Maximum efficiency is possible only with a brace that is designed, constructed and fitted for the particular requirements of each patient. Complete adaptation of the patient to his brace determines its success, with resulting economy. Mass production cannot possibly achieve the desired result, regardless of the highest standard of our industry in general. Strict individualization is even more important than the skillful workmanship and the finest materials.

Standardization has its place in the bracemaker's training and in the procedure in the workshop, but it is definitely out of place in the prescription and fitting of the individual permanent brace.

The Use of Shock Therapy in 305 Mental Hospitals. Lawrence Kolb, and Victor H. Vogel.

Am. J. Psychiat. **99**:90 (July) 1942.

The Mental Hygiene Division of the United States Public Health Service, in conjunction with its consultation and survey service for state mental hospitals, frequently receives inquiries con-

cerning the use of shock therapy in the treatment of patients with mental disease.

Between 1935 and October, 1941, according to tabulation a total of 68,688 patients received shock therapy.

In spite of evidence that the use of insulin and metrazol is declining rapidly, 66 per cent of hospital administrators believe that insulin shock is a valuable form of therapy, 78 per cent believe that metrazol is valuable, while 77 per cent believe that electric shock is of value.

In conclusion, it is evident from the data presented that shock therapy has been widely adopted in mental hospitals and is receiving an extensive clinical trial. The tendency has been to drop the older in favor of the newer forms, but the reasons for change have not always been based on scientific merit. Shock therapy is widely regarded as a promising therapeutic measure, but there is a healthy skepticism that insures careful study of the numerous problems raised by it. This is the essence of progress.

Common Colds and Ultraviolet Rays.

To the Editor. — A patient has called my attention to the article entitled, "Conquering the Common Cold and Other Air Borne Infections," which appeared in the *New Republic*, Dec. 15, 1941. I should like your opinion as to the value of the new ultraviolet ray lamp mentioned in this article, with particular emphasis on its use in combating the germ of the common cold. — M.D., Louisville, Ky.

Answer — William Firth Wells, and Mildred Weeks Wells [*Am. J. Pub. Health* **28**:343 (March) 1938] began work with the installation of ultraviolet ray lamps set up under competent and rigid medical control in order to determine their value in controlling the sanitary quality of the air, with the hope of reducing respiratory disease.

Studies are being conducted at the Henry Phipps Institute in Philadelphia, and at the Cradle Society, Evanston, Ill. (*The Journal*, April 11, 1942, p. 1271), which it is hoped will aid in determining the usefulness of ultraviolet rays in sterilizing the air.

Since the virus presumed to be responsible for colds has not been isolated or recognized, definite evidence of the effect of ultraviolet rays in combating colds is not available.

The evidence thus far presented seems to indicate that ultraviolet ray barriers set up between the cribs of infants in nurseries may help prevent the transmission of respiratory infections from one baby to another. Whether the installation of ultraviolet ray lamps in crowded rooms or in the sickroom will aid in preventing the transmission of colds has not been determined. — [Reprinted with permission, J. A. M. A. **118**:1525 (April 25) 1942.]

The Present Status of Transurethral Prostatic Resection. J. A. Hendrick.

Tri-State M. J. **14**:2711 (June) 1942.

The differences of opinion may be roughly divided into three main groups. First, those who feel that the supra-pubic or perineal prostatectomy is still the operation of choice. In support of this belief, urologists point out the high mortality, morbidity, and complications in the hands of those unskilled in transurethral surgery. The second group consists of those who believe transurethral surgery should be reserved for median bars, contracture of the bladder neck, and small median lobe hypertrophy. In other words, these are the ones who adhere to a "middle of the road" policy, reserving the large majority of cases of prostatic obstructions for so-called "complete prostatectomy." The third group is composed of urologists with special training in transurethral surgery who believe that transurethral prostatectomy, if correctly employed, has many advantages over either the supra-pubic or perineal routes. Statistics from leading men in urology over the United States have shown this to be true.

Treatment of Ringworm of the Feet. Roy L. Kile.

Ohio State M. J. **38**:333 (April) 1942.

Ringworm of the feet is an infection with one of several fungi, usually occurring between the toes or on the soles of the feet. Epidermophytosis is a more frequently used term for this type of infection and tinea pedis is also a satisfactory name, but not in general use.

Measures toward eradication of secondary infection are essential before any thought need be given the fungus infection. Hot packs of aluminum acetate, boric acid, or a weak copper sulfate solution are often efficacious.

Various physical agents are used in the treatment of epidermophytosis. Superficial roentgen rays, judicially used, not only decrease perspiration, but also seems to help the host ward off the infection. It can be used at any stage. Ultraviolet is probably of some value. Iontophoresis of copper solutions into the skin was thought for a time to be helpful, but it is now slowly being discarded, even by those who introduced it. Since the fungi responsible are destroyed by heat, hot baths for short periods are of value, providing thorough drying follows them, and the skin is not allowed to become too soggy and macerated. A few cases apparently benefited by freezing. The use of an ethyl chloride spray to the chronic patches deserves further investigation.